

NATIONAL CAR-BUILDER

VOLUME XI:
NUMBER 3.

DEVOTED TO THE INTERESTS OF RAILWAY ROLLING STOCK.

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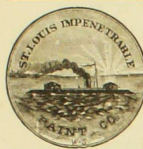
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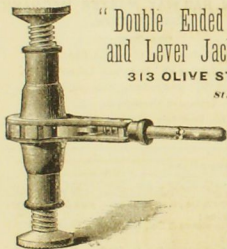
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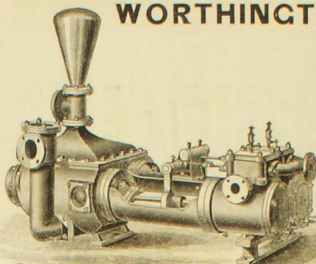
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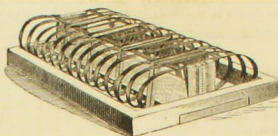
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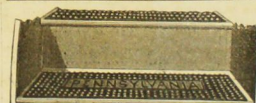
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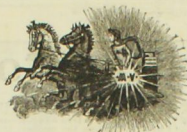
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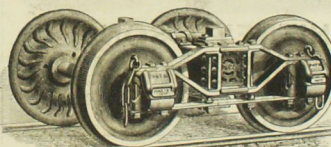
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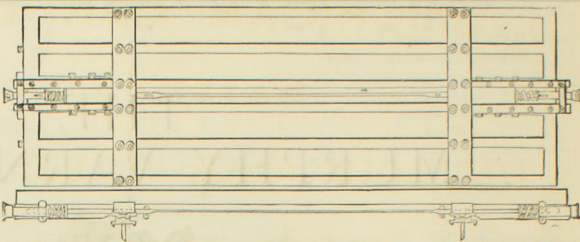
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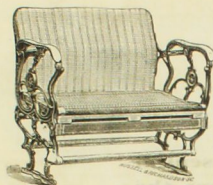
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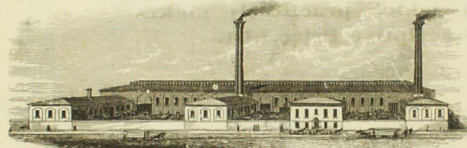
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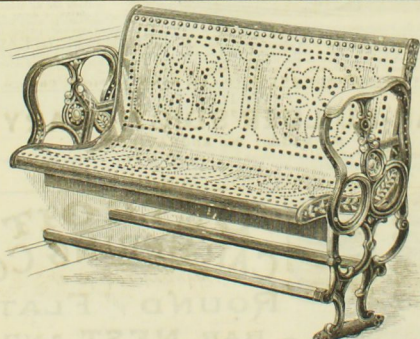
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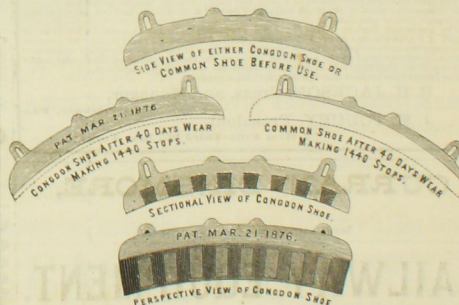
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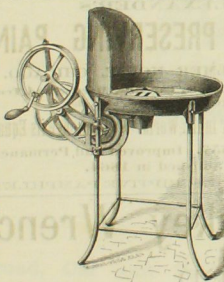
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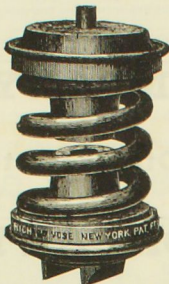
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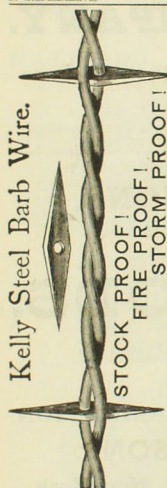
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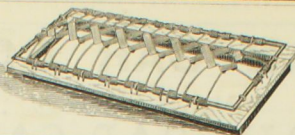
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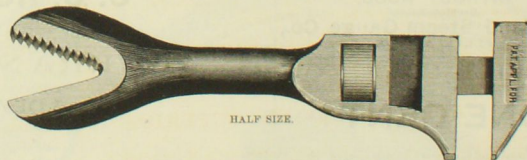
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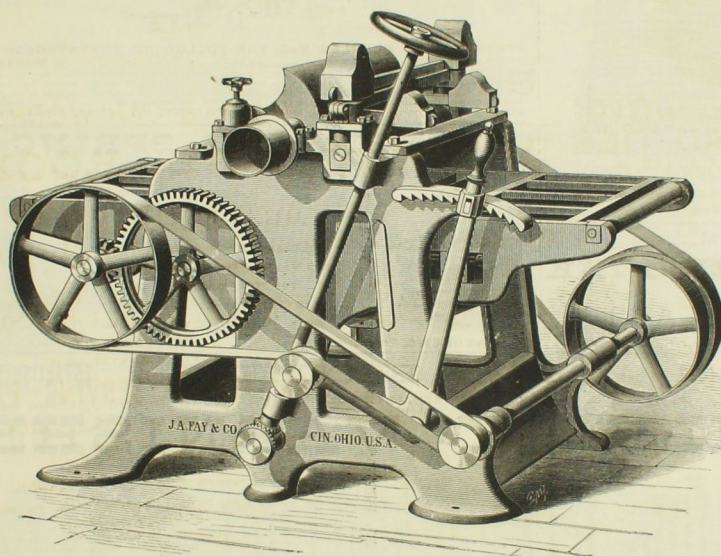
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 Union Pacific R. R.

Ohio & Mississippi R. R.
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 Cleveland, C. C. & I. R. R.
 Atchison, Topeka & Santa Fe R. R.
 Missouri, Kansas & Texas R. R.
 International & Gr. Northern R. R.
 Columbus &ocking Valley R. R.

Lake Shore & Mich. Southern R. R.
 N. Y. Central & Hudson River R. R.
 St. Louis, Iron Mtn & South'n R.R.
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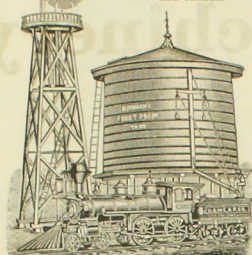
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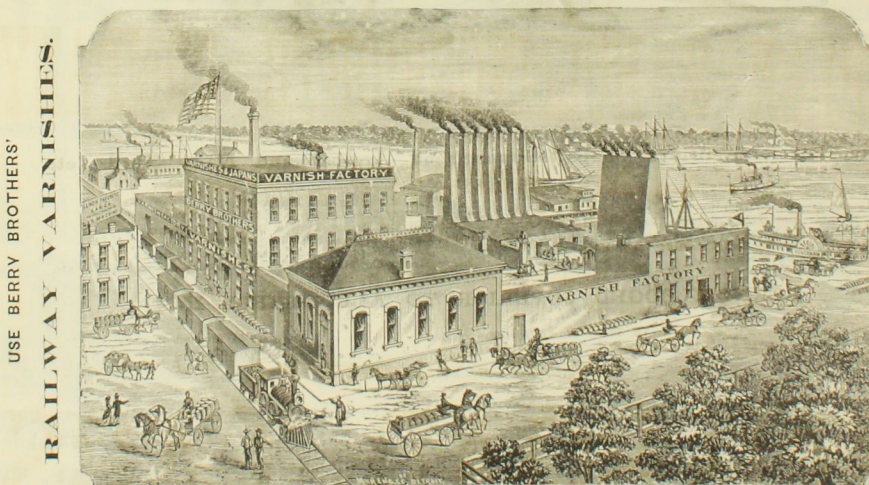
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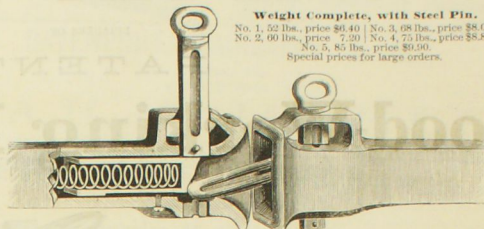
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PENNSYLVANIA SELF CAR-COUPLER.

Made of Chester Steel Casting Co.'s Cast-Steel. Three Times the Strength of Cast Iron.
Light and Durable. An Indestructible Draw-Bar. A Sure Self-Coupler.



Weight Complete, with Steel Pin.

No. 1, 52 lbs., price \$3.40 | No. 3, 68 lbs., price \$8.00
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Special prices for large orders.

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It is light. The freight on the additional weight of a Cast-Iron Draw-Bar, of equal strength, would amount in the life-time of a car to four times the cost of the Steel Bar. The Pins cannot be lost or easily broken; they are fast to the arch. It has all the features of the common Draw-Bar; the same Link and Pin. It will readily couple with cars having other Draw-Bars, and of various heights. It is a sure Self-Coupler. No man need get crushed or injured in coupling. To prevent the car coupling, raise the Pin and turn it sideways, so that the bottom rests on the side of the upper hole. Address orders to

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322 SEVENTH AVENUE, CORNER TWENTY-EIGHTH STREET, NEW YORK.

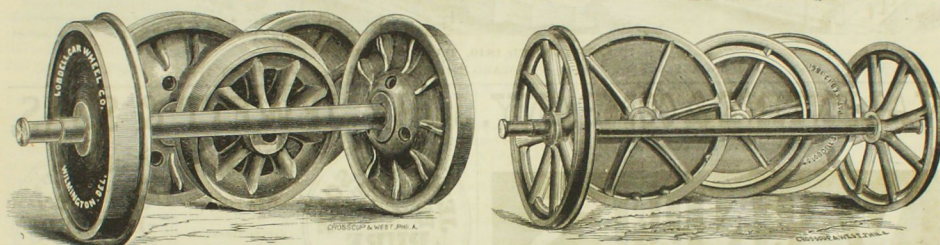


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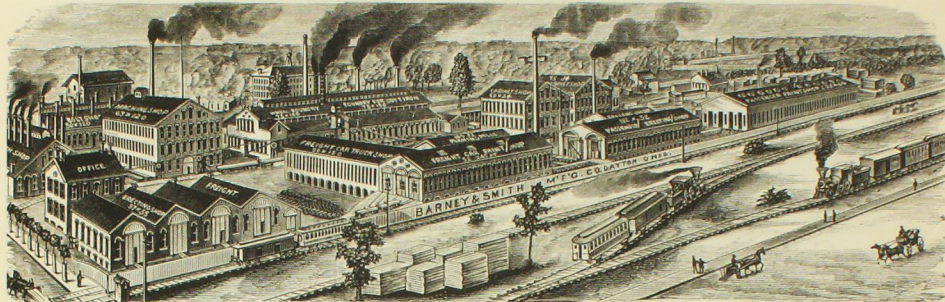
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Capacity, 15 Freight Cars and 100 Car Wheels per Day. AND ALL KINDS OF CASTINGS. Six Million Feet Lumber in Store.
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WHITE LEAD AND LINSEED OIL.

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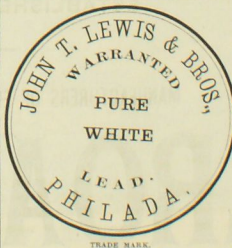
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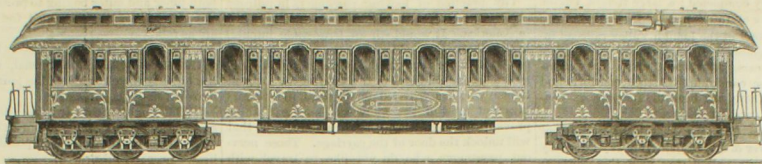
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ORANGE MINERAL,

Linseed Oil,

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THE NATIONAL CAR-BUILDER.



DEVOTED TO THE INTERESTS OF RAILWAY ROLLING STOCK.

VOLUME XL,
NUMBER 3.

MARCH, 1880.

(SINGLE NUMBERS, TEN CENTS.
\$1.00 PER ANNUM.)

Miscellaneous Items.

THE New York & New England road is making arrangements for an improvement of its sleeping-car accommodations between Boston and New York, and intends to have them first class in every respect.

FROM records kept by the Central Railroad of New Jersey, it is learned that the average daily distance traveled by a locomotive is 100 miles; for one month, 2,600 miles. The average cost for men, fuel and repairs for 100 miles is \$12.80.

A THIRD rail is to be put down on the Atlantic & Great Western from Leavittsburg to Salamanca, and from Leavittsburg to Dayton the track will be exclusively standard gauge.

THE average life of a paper wheel under trucks of locomotive engines ranges from 500,000 miles to 1,641,880 miles, and under dining and palace cars from 794,000 to 868,336 miles.

THE Crescent Steel Works (Pittsburg) are building a large two-story brick addition to their warehouse. The extension is 60 feet long and 34 feet wide.

IT is said that a passenger engine is to be built at the Altoona shops expressly to do some experimental fast running. The drivers are to be 6 feet 2 inches.

THERE are now running on the Lake Shore & Michigan Southern road 11 engineers who came from Germany some fourteen years ago, and they are counted among the most reliable engineers on the road.

THE Central Railroad of New Jersey is to have 25 new passenger cars built at the works of the Wason Company, Brightwood, Mass., in time for use the ensuing summer.

THE rolling stock of the Union Pacific consists of 179 locomotives, 165 passenger and baggage cars, and 5216 freight cars.

AS yet, no loaded passenger cars have been precipitated from the lofty tracks of the New York elevated roads into the streets below, but the narrow escapes are so frequent that the occurrence of such a catastrophe would seem to be only a question of time.

THE Chicago & Alton has contracted with the Schenectady Locomotive Works for twenty 40-ton locomotives, to be delivered before May 1. The car stock of the company is being increased in the same proportion.

THE Allen Paper Car Wheel Co. has been organized as successor to the Hudson Paper Car Wheel Co., with A. Gilbert Darwin, President; John E. Gillette, Vice-President; James C. Beach, Secretary and Treasurer. The capital stock is \$1,000,000. The new company intends to build shops in Chicago.

A NEW company, with a capital stock of \$50,000, named the Jacksonville Car Co., has been organized to run the car shops built several years ago in

Jacksonville, Ill., but not occupied until now. Mr. T. C. Dutro, of St. Louis, is Manager.

THE Marshall Car & Foundry Company has been organized to build car works at Marshall, Texas. It is intended to build large shops, thoroughly equipped with the best tools. Mr. Charles Cobb, of New York, is President, and Mr. John F. Dickson, late of Louisville, General Manager.

THE Philadelphia & Reading shops, at Reading, Pa., are building some coal cars 25 ft. long, 8 ft. wide, with very high sides, and carried on two four-wheel trucks. They will hold 20 tons of coal. If successful, a number of similar cars will be built.

THE Barney & Smith Manufacturing Company, at Dayton, O., has contracted to build 300 coal cars for the Atlantic & Great Western, to carry 20 tons each. The company is building five postal cars for the St. Louis Iron Mountain & Southern road.

THE Indiana Car Company at Cambridge City, Ind., is building 100 box-cars for the Illinois Midland, 200 for the Indiana, Bloomington & Western and 200 for the Nashville, Chattanooga & St. Louis.

THE Pullman Car shops at Detroit are building several hotel cars for a line to run between St. Louis and Denver over the Missouri Pacific and Kansas Pacific roads.

THE Grand Trunk shops, at Montreal, are building 1,000 new box-cars for use on the road.

THE National Dispatch Line has contracted for 100 Tiffany refrigerator cars, to be added to 100 already in the line.

MR. JOHN DOLAN has been appointed Road-Master of the Menominee River Branch of the Chicago & Northwestern. He has been conductor of a construction train on the Peninsula Division for some years.

MR. C. D. LAW is appointed Road-Master of the Western Division of the Pittsburg, Fort Wayne & Chicago, vice Robert Learmouth, resigned.

THE Safford Draw-Bar is steadily making its way on prominent roads, nine additional roads having adopted it during the past month. Within the past year upward of 22,000 have been put upon cars, which is a convincing proof not only of its utility but growing popularity.

THE Michigan Car Co., at Detroit, is building 100 Tiffany refrigerator cars, and the Missouri Car & Foundry Co., St. Louis, is also building 50.

THE Cleveland Bridge and Car Works have just completed 300 cars for the Kansas Pacific, and 400 for the C., C. & I. They have contracts also for 850 more cars, divided among five different roads, and are turning out a goodly number of street cars.

MR. WM. H. BARNUM has sold his interest in the Rochester Car Wheel Company, of Rochester, N. Y., to Mr. Chas. E. Chapin and his son, Win. K. Chapin. The company has orders in hand to

keep it busy until July, and has just refused one for 1,200 wheels.

THE Plumbago Oil Company, of Rochester, N. Y. (manufacturers of French's Plumbago Oils), are full of orders, both domestic and foreign. The business of the company is increasing rapidly, a trial of its oils having satisfied railroad men that the use of them prevents hot journals and saves a large item of expense.

MR. F. M. WILDER, lately promoted from Division Master Mechanic of the New York, Lake Erie & Western, at Buffalo, to the position of Superintendent of Motive Power and Machinery for the whole line, with headquarters at Susquehanna, Pa., will have charge of the entire car equipment of the road. He intends to have freight and passenger cars of standard construction, with uniform patterns of such parts as can be made interchangeable. Mr. Wilder is a very capable mechanic, and in his former position won a deserved popularity.

THE Gilbert & Bush Co., Troy, N. Y., is busy with freight and passenger work, comprising 200 box cars for the Wabash, and 150 for the New York & New England, also 50 freight cars for Brazil; 15 Wagner sleepers, 6 passenger cars for the Southern Pacific, 2 for Troy & Boston, 2 for Detroit, Saginaw & Bay City, 2 passenger and 27 freight cars for Nicaragua. It is also repairing 300 Merchants' Dispatch refrigerator cars.

A LARGE number of mechanical engineers met on the 16th ult., at 96 Fulton street, New York, to take preliminary steps for organizing a national society to facilitate the interchange of views, reading of papers, etc., respecting improvements in mechanical science. The society is to be called the American Society of Mechanical Engineers.

J. A. FAY & Co., manufacturers of wood-working machinery, at Cincinnati, O., have orders three months ahead of their ability to fill.

THE House Committee on Patents, by a vote 7 to 3, has refused to extend the Miller Platform and Compiler patent, on the ground that 17 years (the time which it has already run) is the legal limitation. It is stated that Col. Miller has received upward of \$253,000 for his patent since it was granted in 1863, but that a large portion of this amount has been absorbed in expenses.

THE Boston & Lowell R. R. Co. is perfecting a system of switching, at Lowell, by means of which one man in a room in the roof of the new station now building there, can lead all trains to or from the main track. The 16 or 20 sidings will be exclusively in his control for a mile below the station. The new passenger platform will be over 700 feet long and 26 feet wide. The bridge, 75 feet span, is now being thrown over these tracks.

THE Old Colony road is overburdened with freight. A new freight depot is to be built this spring at Fall River, 350 x 60 feet. Two large engines, the "John A. Andrew" and the "Daniel Webster," to be used for passenger or freight trains,

are now nearly completed; a large freight engine is also building at Taunton.

The equipment of the Lehigh Valley railroad includes 238 engines, 71 passenger cars, 36 baggage and express cars, 24,461 coal cars, 1088 eight-wheeled house cars and 1449 stock, platform and other cars. There has been an increase of 3 engines and 200 cars the past year.

The Pullman Company has closed a contract with the Denver & Rio Grande Railway Company for operating its palace cars over this narrow-gauge line. The line will be established with ten sleeping cars, two or three of which will be supplied within the next thirty days. The contract is limited to fifteen years.

The Michigan Central shops, at Jackson, Mich., are building 17 passenger and freight engines. The former will have a capacity for hauling 20 heavy coaches. The boilers are 52 inches in diameter and have 196 flues. The fire-boxes are 6 feet long, and the cylinders 18 x 24.

A NEW sleeping car called the "Manhattan," designed to run from Boston to the West, via Hoosac tunnel and New York, Lake Erie & Western, combines all the latest improvements of the Pullman Company. The ceilings are of oak, elaborately decorated with designs of flowers. The berth fronts are inlaid with different varieties of wood, such as satin-wood, teak, French walnut, amboyna, etc., in new designs. The seats are upholstered with the standard crimson plush used by the company. The gentlemen's toilet compartment and smoking rooms at one end of the car, and the ladies' toilet compartment at the other, are finished in solid mahogany. The interior is divided into twelve sections, which, with four berths in a section, gives sleeping accommodations for 48 persons. Another new feature is the Hicks & Smith hurricane lamp, for which is claimed the merit that no smoke from it can get into the car, and that even a hurricane cannot extinguish it.

DR. HORTON, of reclining-chair renown, has devised a process of heating and cooling passenger cars by distributing heat generated in the baggage car through the entire train. This is done by inside pipes and connections. For cooling purposes, the air is forced through a coil of pipes embedded in ice. Experiments show a variation of 38 to 190 degrees on a moving train, and also his ability to maintain the temperature at any point between these extremes.

THE Connott Valley Railroad, of Ohio (narrow gauge), has just been opened from Cleveland to Canton, a distance of 38 miles. Its business is the transportation of bituminous coal almost exclusively. It is exceptionally well built, having 35-pound steel rails, white oak ties 18 inches from centre to centre, Howe truss bridges and well constructed masonry. The coal cars are made to carry 13 tons (same as standard gauge) 100 of which have been put on the line within the last month. The enterprise is of Boston origin, and is wholly represented by Boston capital.

A NEW car-stove fire-extinguisher has been invented upon a plan similar to the Babcock principle. It is attached to the stove by a tube through which the charge from the extinguisher escapes into the stove when the car reaches an angle of 45 degrees. The extinguisher contains a bottle with sulphuric acid suspended above the water and soda. This bottle is in two parts, held together by a rubber band, and is connected with pendulums at right angles, separate from and independent of each other. When these pendulums are moved to an angle of 45 degrees by a heavy jar, a fall of the car, or a collision, the bottles in the extinguisher are broken, the ingredients are mixed, and the carbonic acid gas is formed at once and escapes into the stove, extinguishing the fire.

The practice of locking passengers in railroad coaches is a custom that would never be tolerated in America. It would stir an irresistible impulse in the liberty-loving bosom of the average American to kick the door open. There is even in England a sort of mild idea of this kind afloat. A gentleman who has traveled a good deal in England says that most of the knowing passengers there provide themselves with small square keys that will unlock the door of the carriage. Those nervous passengers who do not like to travel with locked doors, yet have no key, can easily make one with a piece of silver of the requisite size. Strange as it may appear, the door is unlocked in this way by slipping the silver into the guard's hand.

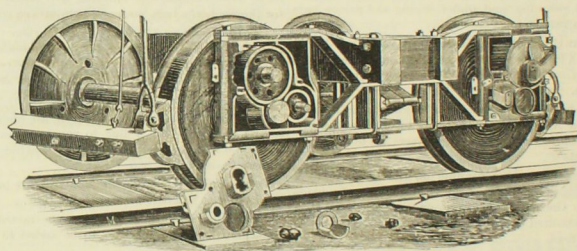
A CORRESPONDENT of the *American Machinist* says: Thirty years ago it required 1800 days' labor to construct a locomotive; now it will not exceed 1500, and a far superior machine in every respect. There are 16,000 locomotives in the United States, and there are over 2800 different pieces in each, all of which will have to be renewed every 10 or 12 years. Locomotives that retain their identity 20 years or more, as claimed by some roads, are something like the boy's jack-knife which he had 10 years, but it had 9 new handles, and 13 new blades. The present capacity of all the shops is not far from 1700 locomotives per year, and the different roads build in their own repair shops about 100 more, making 1800 a year in all. Now, allowing 15 years as the average life of an engine, you will see that the shops can build 27,000 in the mean time, showing that the present capacity of our locomotive shops need not be extended for a long time to come."

both inner and outer boxing to prevent lateral motion. The advantages claimed for this invention are as follows:

1. The face of the friction wheels being as wide as the length of the axle journal, there is much less liability to cut or indent the journals than with narrow-faced wheels.
2. The weight of the car being distributed upon so many journals running at only a quarter of the speed of the main axle, it is impossible for them to heat if properly lubricated.
3. As there is an actual leverage afforded by the friction wheels of more than 75 per cent to overcome frictional resistance, a train must necessarily draw lighter, and thus effect a saving in motive power.
4. The consumption of lubricants will be much less than in ordinary running. The parties, indeed, guarantee that a car mounted upon their boxing will run 1,000 miles with one oiling, and that the journals will not heat at a speed of 50 miles an hour.

As to the liability to get out of order and the necessity of frequent repairs—the great trouble with car friction wheel apparatus heretofore tried—we are not informed. The invention is adapted to both steam and horse-car roads. The proprietors and patentees are the Montross Anti-Friction Car Axle-Box Company, Simcoe, Ontario, who may be addressed for further information.

THE United States Rolling Stock Company has issued a circular to railroad companies notifying them that it is building, at Chicago and Urbana, 500 box-cars, to carry 20 tons of freight, and



MONTROSS ANTI-FRICTION CAR AXLE BOX.

The engraving illustrates the Montross Anti-Friction Axle Box in its application to railway car journals. The box is shown with the face or outer cap removed, and also with the cap in place. The axle journal is supposed to be the standard size (3½ x 7). Above it, but about 15 degrees from a vertical line, is a friction wheel 10½ inches in diameter and 7 inch face, with a 2½ inch steel spindle passing through it having a journal at each end and running in brass boxings fitted in the casing, one form of these brasses being shown in the foreground of the cut. On the side of the journal opposite the brake, is another and smaller friction wheel, 6½ inches in diameter and 7 inch face, which serves as a shoulder or abutment, both wheels running in line. The spindle of the small wheel is 1½ inches in diameter and runs in brass boxing like the large one. Underneath the journals of both wheels are large oil cups formed in the casing and extending into the annular spaces of the wheels. Connected with the cups are channels running to the edges of the casing, through which the journals are oiled and the waste supplied or removed, the channels being provided with suitable covers to keep out dust and dirt. The car axle has the usual collar and shoulder between which the friction wheels revolve, thus making use of

that it will be prepared to deliver them to companies leasing them in April, May and June. It is very likely that this matter of carrying such heavy loads in freight-cars will soon occupy the attention of track engineers, as having a tendency to affect the economy of their department injuriously. Which is to be the policy of the future—light cars and light loads or heavy cars and heavy loads? It does not seem in the nature of things that a car can be devised that will carry economically a heavier load than one and a half times its own weight. This is a vital subject and ought to be discussed.

A YOUNG man, while attempting to fix a "misplaced switch" on a young lady's head in a ball-room, stepped on her dress and "wrecked the train." She told him to conduct-or to a seat and be more car-full in future.

THE brakeman of a passenger train looks forward to the time when he shall be conductor. The freight brakeman merely looks out for bridges.

COL. R. E. RICKER, formerly Superintendent and Engineer of the New Jersey Central, and later of the New York Elevated road, has accepted the position of General Manager of the Gilbert & Bush Car Works at Troy, N. Y.

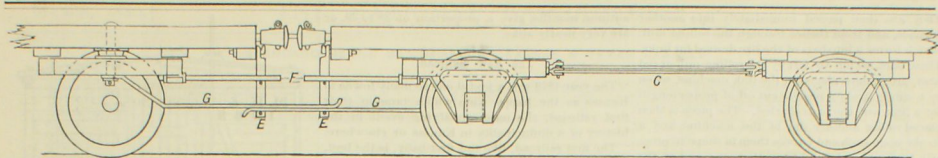


Fig. 1.

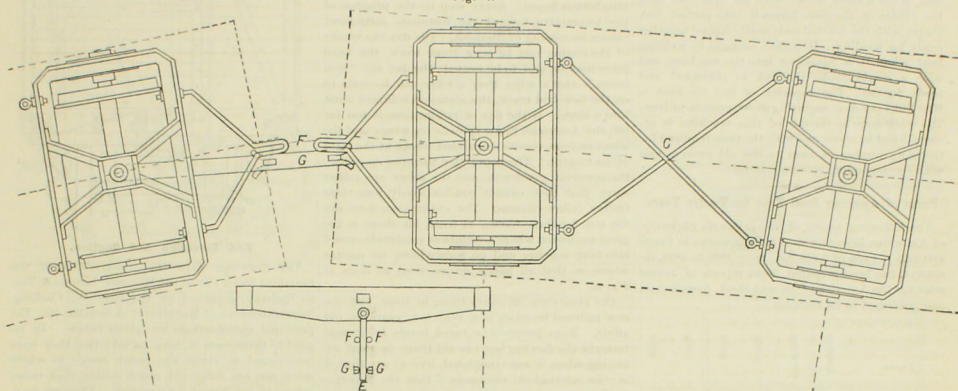


Fig. 2.

FLEXIBLE WHEEL-BASE FOR FOUR-WHEEL CARS.

The above drawings illustrate a plan for keeping the two axles of four-wheel cars on the radial line of curves. Fig. 1 is a side view of such a car, and a longitudinal section of part of another car to which it is coupled. Fig. 2 is a top view of the single axle trucks of the same car, with their connections, and also certain other connections with the preceding car which will be described. The object of the inventor is to control, by means of the construction shown, the trucks or axle-frames so they can not turn or rotate on their centres while on a straight track, nor avoid doing so while on a curve. To accomplish this, he connects the two trucks by the diagonal rods *C*, so that when one turns on its centre, the other must also turn to the same extent, but in an opposite direction. This, however, is not claimed as any new device. It has been tried with slight modifications many times, but with results that were not satisfactory, and for the following reasons: When the forward axle of a car so constructed enters a curve, the outer wheel, owing to the longer distance it has to travel, slips back, and by means of the connecting rods the rear axle throws its outer wheel forward, thus causing the line of the axles to deviate more from the centre of the curve than if they were rigidly at right angles with the car itself. The outer wheel of the rear axle also slips back on entering the curve, and the two axles will, for the moment, as it were, strive for the mastery; and as the inner rail strongly resists the advance of the forward inner wheel, the axle yields and throws the outer wheel forward so far that the axles, instead of pointing directly toward the curve centre, point *within* the radii.

From this it is plain that if by any means one of the axles can always be kept at a right angle with the rails, the other must necessarily be kept so. To do this the inventor uses a light guide-bar *G* made of flat iron, and in two pieces, the inner ends being attached to the king-bolts of the two cars, as shown. Directly over this bar, and attached to the truck frames, are two projecting arms *F*. From

the centre of the end-sills is suspended from a hoop-bolt the levers *E*, which pass between the arms *F* and through slots in the guide-bars *G*. These attachments are not placed between each car of the train, but only between every two cars. The operation of this plan is as follows: When the train is on a straight track the guide bars *G* will keep midway between the rails and parallel thereto, the levers *E* hanging vertically, holding the arms *F* in the centre of track and the axles at a right angle with the rails. When the cars strike a curve, however, the guide-bars become a chord in the curve and carry the lower ends of the levers with it, and the arms *F* following the lever movement, cause the trucks to rotate and the axles to conform to the radial line, in which position they are kept by the suspended levers *E* until the cars leave the curve.

It is estimated that cars of this description can be built to weigh not exceeding 9,000 or 10,000 pounds, and with a carrying capacity of from 10 to 12 tons. The additional weight of the axle frames as compared with cars having no trucks at all, is deemed a trifling consideration in view of the diminished wear of track and wheels, the longer service of cars, and the lighter tax on the motive power. This plan will at all events be interesting to the roads that are building and running four-wheel coal and box cars with rigid axles and a 11-foot wheel base.

Drawings and working models may be seen at the office of Mr. Geo. C. Betts, 60 Wall street, New York.

The Indiana Car Company, at Cambridge City, Ind., has taken a contract to build 100 cars for the Chicago, Pekin & Southwestern.

The Terre Haute Car Works, at Terre Haute, Ind., have contracted to build 350 freight cars for the Cairo & Vincennes road.

The Harrisburg (Pa.) Car Company has an additional order from the New York Central for 1,025 box cars.

Damages for Injury to a Yard-Man.

The *Detroit Post and Tribune* of Feb. 10 says: "The case of John L. Smithson against the Michigan Central in the Superior Court for several days past, was concluded with a verdict for the plaintiff for \$5,000 damages. Smithson was a yard-man in the Michigan Central yard, and his hand and arm were caught between the bumpers of two freight cars, and he was so badly injured as to be incapacitated from further labor. The cars were Erie cars, and were provided with 'dead-woods,' a device which is considered extremely dangerous, and which has been discarded by the Michigan Central on its own cars. The plaintiff was not aware that the cars in question had 'dead-woods,' and before he knew it his hand and arm were caught, he slipped, and was dragged along the track and had a narrow escape from being killed. Counsel for plaintiff claimed that it was gross carelessness on the part of the railroad company to make use of such cars, and that, therefore, it was liable for the injury to its employé. The case will undoubtedly go to the Supreme Court."

A Machine for Making Coupling Links.

Mr. Stephen Uren, a foreman in the blacksmith department of the Central Railroad shops at Sacramento, Cal., has invented a machine for the manufacture of car coupling links of refuse scrap. The machine is in the form of an attachment to the ordinary steam hammer, consisting of dies placed in the hammer and bed, to cut the iron to its proper length, curve, bend, lap and weld the links. This is all done with such rapidity that the iron does not lose its heat from the time it is first taken from the furnace until it is complete in links. The refuse pieces of wrought iron are weighed out and put up in the usual way for blooms, placed in the furnace, and when brought to the proper heat, they are then taken, one at a time, and placed under a 5000-pound steam hammer, and by a few strokes are formed into billets of four inches square.

They are then passed immediately into another furnace, and from thence through the rolling mill, which forms it into bars of the size desired for links. These bars, which are left by the rolling mill at red heat, are at once placed in the link machine, when by a single stroke a piece is cut off of proper length for a link, and the ends scarfed. The piece is then placed under another die of the machine, and a stroke upon each end curves them in shape to properly form, when brought together, one end of the link, while a third stroke with an oval die upon the centre of the piece forms it into perfect link shape, with the scarfed ends neatly lapped together ready for welding. It is then brought to welding heat, when it is again put into the machine, and with a single stroke the link is perfected and ready for use. The capacity of the machine is 1000 links per day, requiring 66,000 pounds of iron. The work done by the use of this machine is accomplished in about one-fifth the time required for the same number of men by the old process, and with corresponding economy in fuel.

Prices of American Steel Rails for Twelve Years.

The following record of the prices (in currency) of American Bessemer steel rails at works in Pennsylvania per ton of 2,240 lbs., from 1868 to 1879, inclusive, has been prepared from reports of actual sales for the American Iron and Steel Association, and published in its *Bulletin*:

YEARS.	January.	February.	March.	April.	May.	June.
1868.....	\$165	\$167½	\$174	\$172	\$165	\$162½
1869.....	140	143½	133	134	130½	128
1870.....	110	110	108½	107	108	105½
1871.....	95	96	100	95	103	104
1872.....	104½	104	104½	111½	110	111
1873.....	121	120	122½	120½	120	121½
1874.....	117½	117½	115	108½	98½	96½
1875.....	71	71	71	68	69	69
1876.....	67	65	62	62	62	60
1877.....	49	49	49	49	47½	46½
1878.....	41	41½	41½	42	43½	43
1879.....	41	42	42	42	42	45

YEARS.	July.	August.	September.	October.	November.	December.	Yearly average.
1868.....	\$150	\$150	\$150	\$150	\$148	\$147½	\$150½
1869.....	130	130	130	130½	130½	130	130½
1870.....	110	110	108½	101½	102½	98	109½
1871.....	109½	104	106	103½	103½	100½	105½
1872.....	114½	115½	114	113½	118	120½	112
1873.....	121½	121½	118	120	120	120	120½
1874.....	91	89½	78½	78½	75½	72½	84½
1875.....	69	69	69	67	66	65	68½
1876.....	59	59	56	54	53	52	56½
1877.....	45½	44½	44	43½	40½	40½	45½
1878.....	43½	43½	43½	42½	42	41	42½
1879.....	45	48	50	52	53	63	48½

Locomotive Boiler Explosions.

The *Railroad Gazette* publishes a table which gives a total of 139 locomotive boiler explosions within the past eight years, and calls attention to the curious fact that the number of such explosions in cold weather is considerably greater than in summer. Thus, in the six warm months, April, May, June, July, August and September, there were, during the eight years, 55 explosions, while during the same number of years there were 84 explosions in January, February, March, October, November and December. For January of 1872, there was no report of accidents made. The omission, if supplied, would probably make the difference still more apparent. The three winter months, if compared with the three summer months, give a proportion of 42 explosions during the former to 23 in the latter. With the omissions for January, 1872, added, in all probability it would make the proportion of very nearly or quite two to one. The three spring months, compared with the three

autumn months, give a proportion of 35 to 39, or are very nearly alike.

The New Railroad.

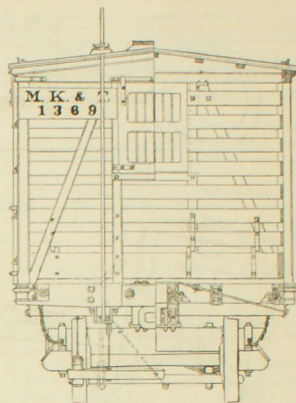
The year 1879 was a joyful one to many towns in Kansas as the happy time which brought their first railroad, the most gratifying event in the history of a municipality in Kansas or elsewhere. The first railroad, like the first baby, is the best. It is the source of boundless joy, the fountain of numberless hopes. Every step in the progress of the locomotive toward the fortunate settlement causes increasing excitement. The day the smoke of the engine can be seen from town, the local press may be said to be heated; the day the "iron horse"—that's what they always call it—rolls in on the new-laid track, the aforesaid columns burst into a blaze. If the day of publication is too far off, the American Eagle spreads his wings and the silent cannon vomits its printed smoke at the head of an "extra." The population turn out *en masse*; the convivial get drunk, and the sober are rather sorry that they cannot conscientiously join their festive fellow-citizens. The enthusiasm does not die out for three weeks, at least, for there is the great excursion where a countless multitude crowd into four coaches and go somewhere, no matter where, so that all hands return tired as dogs at 2 A. M.

The gloss rubs off every thing in time, and the new railroad becomes in a very few years an old affair. Many people who voted bonds for it, and brought the flowing bowl to aid them in their rejoicing when it was completed, live to say that it is "an infernal old monopoly;" that the Superintendent is an overbearing tyrant, the Station Agent a blockhead, and that the Mail Agent throws off his sacks at the wrong places.

Neither the old "jubilantes" or the later growlers are exactly right, but the former are much nearer right than the latter. A railroad is a grand, good thing. It does not make a metropolis of every town it reaches, but there are few towns it does not improve, and no town, in exchange for the lifting of any amount of its bonded debt, would be deprived of one after having once enjoyed it. Kansas is the railroad State, hence the prosperous State, and in no year in her history has been fuller of brightness than 1879.—*Atchison Champion*.

A case involving the liability of sleeping car companies for the loss of the personal effects of passengers, has recently been decided by the Indianapolis Superior Court, in the suit of Diehl vs. Woodruff. A judgment was rendered for plaintiff at special term and affirmed at general term, for watch and money valued at \$396, the evidence showing that the property was stolen from his berth while he was asleep during sleeping hours. The grounds of the decision are that the passenger having contracted for sleeping accommodations, and the company having agreed to furnish them, it is bound to use such care as the contract implies, inasmuch as the passenger can not sleep and exercise personal supervision over his property at the same time. It seems that in this case the only employes about the car were the conductor and porter, and that the conductor was absent during a run of 84 miles, while the porter was busy cleaning boots—thus leaving the car with no protection against pickpockets.

"TRAINS," says a fashion report. "are very plain this season." They are carefully plain. Once in a while when they make up a freight train from the red, blue, and white lines, and put in an old tank or two, there is a little variety; but there won't be any thing really artistic in trains until Barnum gets on the road with those cars frescoed with blue monkeys, yellow tigers, purple elephants, striped snakes and things, engaged in bloody and mortal combat.



End Elevation and Section.

The drawings show the construction of the Standard Stock Car of the Missouri, Kansas & Texas Railway, designed by Mr. Geo. W. Cushing, Superintendent of Machinery, at Sedalia, Mo. The principal specifications are given below. In regard to these cars it may be said that they have been found to stand the rough usage to which stock cars are subjected much better than many others of a different construction. They are used, indeed, for many other kinds of freight—for almost every thing, in fact, that will not injure by exposure to the weather, including iron, coal, stone, lumber, etc. The end-doors are designed for the admission of railroad iron and other long freight. The inside is frequently sealed up with thin matched stuff so the cars can be used for transporting corn or grain in sacks. This method of utilizing them for different kinds of freight has been found to work better than the regular combination box and stock cars which have been tried on the line; but Texas shippers would not ship live-stock in them.

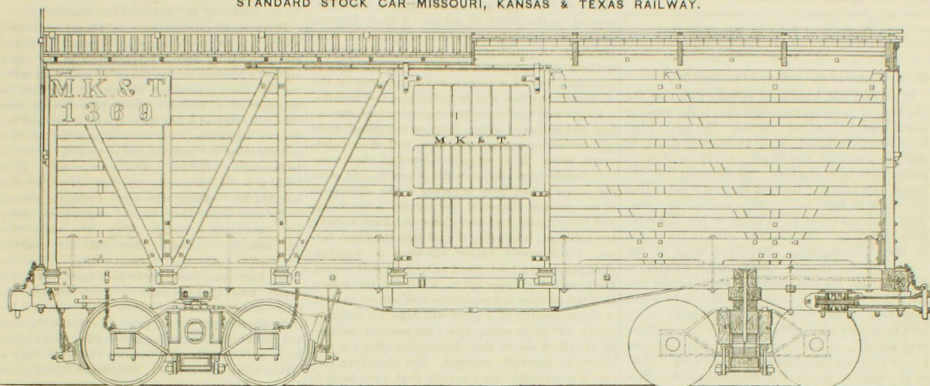
GENERAL DIMENSIONS.

Total length of each sill, 28 ft. ¼ in.
Width of body, 8 ft. 4½ in.
Height from under side of sill to top of plate, 7 ft. 8 in.

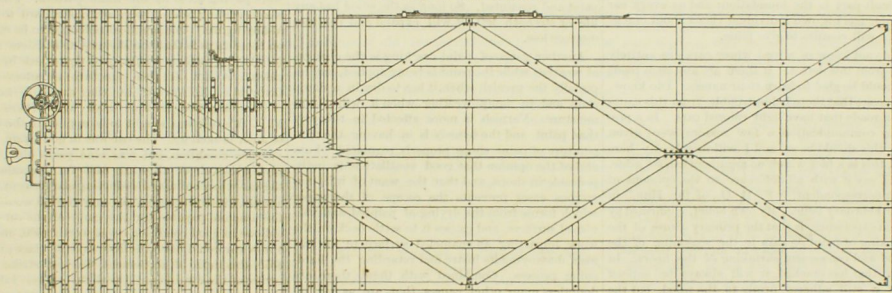
BODY TIMBERS.

- 2 outside sills, of Norway pine or best clear northern tamarac, 8 × 4½ × 27 ft. 5¼ in. long over all.
- 2 intermediate sills, of same material and dimensions.
- 2 inside sills, of best white oak, same dimensions.
- 2 end sills, of best white oak, 8 × 5 in. at ends, 9 × 5 in. in centre, by 8 ft. 4¼ in. long.
- 2 needle beams, of best white oak, 8 × 4 in. × 8 ft. 4¼ in. long over all.
- 2 plates, of Norway pine, 6 × 3 in. × 28 ft. ¼ in. long.
- 2 end plates, of white oak, 3 × 6 in. at ends, 3 × 12 in. in centre by 8 ft. 6¼ in. long over all.
- 7 inside carlines, of white oak, 4 × 1½ in. at ends, and straight on under side, 8 ft. 10¼ in. long over all.
- 1 centre rib, of white oak, 3 × 2 in., 28 ft. ¼ in. long.
- 4 side ribs, of white oak, 2¼ × 1½ in., 28 ft. ¼ in. long.
- 8 diagonal ribs, of white oak, 4 × ¾ in.
- 2 transoms, of white oaks, 13 × 5 in., 8 ft. 4¼ in. long.

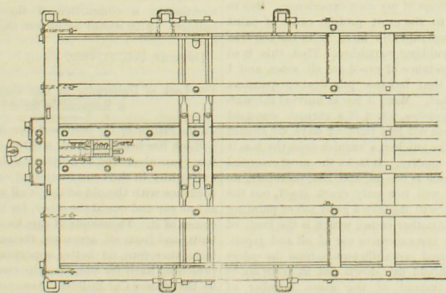
STANDARD STOCK CAR-MISSOURI, KANSAS & TEXAS RAILWAY.



Side Elevation and Section.



Plan of Roof.



Plan of Frame.

2 buffer blocks, of white oak, $9 \times 5\frac{1}{2}$ in., 2 ft. 3 in. long.
4 draft timbers, of white oak, $8 \times 4\frac{1}{2}$ in., 4 ft. 10 in. long.
4 corner posts, of white oak, $5\frac{1}{2} \times 3$ in., 7 ft. 13 in. long over all.
12 intermediate posts, of white oak, $3 \times 3\frac{1}{2}$ in., 7 ft. 13 in. long over all.
4 end door posts, of white oak, $4 \times 2\frac{1}{2}$ in. \times 6 ft. 8 in. long over all.
16 braces, of white oak, $2\frac{1}{4} \times 4$ in., 7 ft. 4 in. long over all.
2 ladder braces, of white oak, $1\frac{3}{4} \times 8\frac{1}{2}$ in., 7 ft. 13 in. long over all.

4 side base boards, of southern pine, 10 in. wide \times 2 in. thick, 11 ft. 3 in. long.
28 side slats, of southern pine, $5 \times \frac{5}{8}$ in., 11 ft. 3 in. long.
2 end base boards, hinged, southern pine, 10×2 in. \times 8 ft. 3 in.
6 end slats, of southern pine, $5 \times \frac{5}{8}$ in. \times 8 ft. 3 in. long.
16 end slats, of southern pine, $5 \times \frac{5}{8}$ in. \times 3 ft. 13 in. long.
2 brake beams, of best white oak, $3\frac{3}{4} \times 7$ in. at centre, and $3\frac{3}{4} \times 4$ in. at ends; 5 ft. 9 in. long.
Roof of white pine, best quality, $3\frac{1}{2} \times 5\frac{1}{2}$ in. wide, double, and joints overlapped.

Running board, of white pine, 16 in. wide by $1\frac{1}{2}$ thick.

Floor of yellow pine $1\frac{1}{2}$ in. thick (finished), and not over 9 in. wide, tongued and grooved. Floor to be slatted.

CONSTRUCTION.

Transoms capped with cast-iron plates $\frac{3}{4}$ in. thick by $4\frac{1}{2} \times 13$ in. across ends; five $\frac{1}{2}$ in. rods across body of car at top; four $\frac{1}{2}$ in. cross truss-rod; 2 side doors, 6 ft. 6 in. long by 4 ft. 9 in. wide, framed of white oak; 2 end doors, 2 ft. 4 in. wide, 2 ft. 11 in. long; 2 trap doors in roof, 22 in. long by 16 in. wide, strap hinged; four $1\frac{1}{2}$ in. truss rods from end to end of car, with turn-buckle in centre; king-bolt $1\frac{3}{4}$ in. wrought-iron, 2 ft. 4 in. long; brake wheel $14\frac{1}{2}$ in. diameter and set 2 ft. above roof casting; brake beams, of white oak $3\frac{3}{4} \times 7$ in. centre, $3\frac{3}{4} \times 4$ in. ends, 5 ft. 9 in. long; all outside woodwork to be well painted with mineral paint, and iron work with one coat of heavy black paint.

Trucks same as for the road's standard box car. [See CAR-BUILDER for Sept. 1879.] Washburn's double plate 33 in. wheels, broad tread, bored straight, weight 550 lbs.; axles hammered; journals $3\frac{1}{2} \times 6$ in.; wheel base 4 ft. 9 in.; track timbers of clear white oak.

FIREMEN are utilized in two ways. Either they are promoted to be engineers, or are tried out for the oil with which they are saturated. They are tried in either case. A fireman, after a year's service, will yield more oil than a sperm whale of ten times his weight.

Communications.

The Cracking of Paint on Passenger Cars.

To the Editor of the National Car Builder:

It is a fact well known to railway men that the cracking of paint on passenger cars is the cause of much annoyance to car painters. The subject has been much discussed, with an earnest desire to discover a remedy, but as yet no very satisfactory results have been reached. The cracking still continues, and many of the best finished coaches that have been in use two or three years on our principal roads are found to be more or less defective from this cause. Car painters have in the course of their investigations discovered some of the reasons for the trouble. Each master painter, or foreman, has his own ideas as to the causes and the remedy, but at the same time is slow to admit that there are any cars with cracked paint on his own particular road, although others can see them very plainly. In the course of my own experience I have given special attention to body work. This, as it seems to me, is the essential point. Mere decoration is well enough in its way, but the most difficult part is the foundation; and as every car painter has his own individual views about cracking, I will venture to give mine.

I do not know of a road whose cars are entirely free from this defect. If there are any such roads I should be glad to learn their names. I do know, however, that there is less trouble from this cause upon roads that have light colored cars. In a previous communication a few reasons were given why this should be so, and I will merely say here that this is a fact which no argument can set aside, and I say it with all deference to the opinions of your correspondent, "F. B. G., of the Hub," in your February issue. My own belief, confirmed by much experience, is that the primary cause of the cracking of paint on cars is the seasoning of the wood and consequent shrinking of the fibers. In paint that has cracked, it will always be noticed that it still adheres firmly to the wood, but the wood has contracted and broken the surface of the paint over it. Now, if the paint could be prepared so it would expand and contract with the wood in all changes of weather, there would be no danger of cracking; but ordinarily in priming a car all the oil is given to it that the wood will absorb, and then less oil is used until the finishing coat of color is reached, which has very little oil in it. This coat is, therefore, brittle and easily disturbed, there is far less elasticity in the color-coat than in the wood or priming coats, and it would be strange indeed if it did not crack and show after a time what is called fine spongy color-cracks, but which do not have much depth, thus indicating that the flat colors are the cause of this kind of cracking. A car can be finished with oil color only, using no japan or varnish, but simply linseed oil slightly boiled to get the water out of it, and a small quantity of turpentine to make it work free, and the paint will not crack because the coats are all prepared alike and have the same elasticity as the wood. This method, however, will not give a finish suited to passenger cars, and is of no consequence except to show that the wood and paint will in this way resist equally the tendency to expand and contract. Wood never gets so well seasoned that it will not shrink, especially in warm, dry weather. The hot summer sun and the drying and bleaching winds of autumn injure paint more than the steady cold winter or spring months do. Heat is the most destructive element we have to contend with. It draws the life out of the paint, and the darker the car the more it draws the heat, while light colors have a contrary effect. Upon this point Mr. Gardner's "opera-glass" may be of

some service perhaps to car painters who are unable with their natural eyes to discern the difference in the durability of colors. A finely finished car suffers much from sudden extremes of temperature. A panel may be painted and kept in a uniform temperature for years with no signs of cracking, but let it be exposed on the roof of the shop and the effect will be visible in a few months.

I have said that wood never gets through shrinking, and will say further, that coarse-grained wood will shrink most, and, of course, will show paint-cracks most. It is often wondered at that some side-panels show cracks, while others on the same car do not. The cause is owing to the difference in the grain of the wood, the former being coarse and knotty, and the latter closer and finer, holding the paint and admitting the oil into the fibers better. Hard woods, under exposure to weather-changes, do not hold paint as well as soft woods, the paint being more apt to scale, for the reason that the oil does not penetrate and adhere as well. A slight opening of a joint will take up moisture which will creep along under the painted surface; all of which shows that finishing-lumber for cars should be carefully selected. The shrinking process is perceptible even in cars that have been in use ten or fifteen years, when stripped of their old paint and repainted. So long as the wood has any life or strength left, it will expand and contract more or less.

Another cause of paint cracking is the changes of weather while the paint is being applied, and especially the varnish when it has to dry in a damp shop, and in damp weather when it will absorb moisture. Varnish is more affected in this way than paint, and the remedy is in having the temperature of paint shops properly regulated. I am also of the opinion that good ventilation is indispensable in shops, and that the want of it in numerous cases prevents the escape of the vapor which forms from the drying of painted and varnished surfaces, and causes it to settle back on the work, imparting an enameled surface to the varnish, destroying its lustre and retarding the hardening process. Combined with these there are doubtless many other causes that are as yet imperfectly understood. What I have said are merely suggestions of my own experience. But to come directly to the most prolific cause of paint cracking, we undoubtedly have it in the too free use of quick rubbing varnishes. That this is so there is an abundance of proof on all sides, and I venture to say that but few practical car-painters will deny the fact. Many a job is hurried through with these varnishes, when, if a varnish was used that would rub in not less than six days, we should discover that the quicker a varnish dries the less it has of wearing quality. It lacks the most essential ingredient, which is the oil, and has, therefore, no elasticity. It will not only crack itself, but the quick rubbing will destroy a good job of painting underneath. Another cause, which is the fault of the painter, is the excessive use of oil and japan. Oil should be used just sufficient to bind the colors well, but it should dry down flat in from six to eight hours. Instead of the same number of minutes, for I claim that color is just as liable to crack by not having enough oil in it, as it is by having too much, and herein I disagree with some of the craft, who think that color cannot be made to dry too flat, and who give it only oil enough to spread it on the work, and flatten down as soon as it is laid off. I have long pursued a medium plan, and with good results. Color requires oil in sufficient quantity to give a solid surface when dry, otherwise, it is porous, and will absorb the varnish, instead of holding it out, and giving protection to the color coats. By adopting this plan, and by ceasing to use quick-drying varnishes, two of the principal causes of the cracking of paint on passenger cars will be avoided.

BUCKEYE.

The Cost of Cars—Settlement for Cars Destroyed.

To the Editor of the National Car-Builders:

There is no circumstance of recent occurrence which has so much surprised general managers and purchasing agents of railroads as the extraordinary increase in the prices of materials entering into the construction of cars. I hear that the manager of a Western road, who wanted more cars, telegraphed a few days ago to a car-building firm to build him "as soon as possible, 500 cars, exactly same as last lot just delivered, price and terms same as before." The answer was, "If we build you 500 cars, same price as before, we shall lose \$88,000." Those who were fortunate enough to get cars before the "boom" ought to be happy, but, naturally enough, they are not; they are annoyed because they did not contract for more. At the present date, axles, bar iron, cast iron and hardware, cost more than double what they did eight or nine years ago. The axle-makers had a convention at Cleveland a few days ago and put up the price of axles to 5½ cents per pound, and, excessive as this price may appear, it is undoubtedly justified by the high rate at which scrap iron is held. Wheels are selling round here for \$16 to parties who only a few weeks ago were paying \$9.50 for the same pattern. Pine is also becoming more costly, and oak is hard to get at any figure. One practical reflection to be made on these facts is that the Master Car-Builders' rule for making settlements for cars destroyed by accident, is apt at this juncture to affect unfavorably the owner of the cars. I heard of an instance a few days ago, where the M. C. B.'s rule was sought to be applied in the case of a car broken up. The car was in good, fair, serviceable condition, but was nine years old. Applying the rule of allowing \$435 for the value of the car when built, and deducting six per cent. per annum for depreciation, the sum of \$196 would be the amount payable for the car. As the car—an old one in good condition—was worth \$500, and as a new car could not be built to take its place under \$675, this mode of settlement did not strike the owner of the car destroyed at all favorably. I think the assumed value as the basis of settlement for cars destroyed ought to be determined once in three months by a committee of three master car-builders. \$700 would be nearer the average value now.

EOBERT.

DETROIT, Feb. 21, 1880.

The Lack of Uniformity in Car Construction—Who is Responsible for it?

To the Editor of the National Car-Builders:

Much has been said and written during the past few years about the advantages to be derived from uniformity in the construction of cars; but, in accordance with the old adage, it all appears to go in at one ear and out at the other, for little or nothing comes of it. Thousands of cars have recently been built, and from all accounts, thousands are being built, therefore, no better opportunity could have presented itself for adopting the resolutions passed by the Master Car-Builders' Association; but, from an inspection of the cars, it is evident that little or no attention has been paid to the important points so often discussed by them at their meetings. From this apparent apathy, the question may pertinently be asked, What is the reason of this, and who are responsible for it? Surely there are among railroad officials many who must be alive to the large saving to be effected in the working of their departments, and who, if they were untrammelled and in a position to follow the bent of their own inclinations, would adopt some course which would, at least, provide for a uniformity in the building of their own cars, and so far show some consistency in themselves, and thus by their influence endeavor to induce others to follow their

example. But of the hundreds of roads on this vast continent, where is there one that has followed the course suggested? Precept has declared uniformity to be the panacea for existing evils; but practice has not confirmed the remedy, and hence the question arises, Who are responsible for it? If the writer might venture an opinion, he would say that general managers and superintendents are at least somewhat to blame in the matter, for they have only to say the word and request their master car builders to carry out the resolutions they have indorsed at their conventions year after year, and then, if not carried out, know the reason why.

In these days, when interchanging of cars is the rule and not the exception, common sense would seem to indicate that all those parts liable to get out of order should be made similar in pattern, so that the material to be kept in stock and ready to replace damaged or broken pieces might be reduced to a minimum. At present, it is necessary to keep a dozen kinds of axles, and over a score of patterns of axle-boxes and brasses; also as many draw-bars and connecting pieces, and a like variety of brake attachments, pedestals, guides, centre-plates, hangers and other fixings. Just imagine for a moment the magnitude of this heterogeneous mass of material, which must be kept in stock by such roads as the New York Central, Erie, Lake Shore and others, where thousands of cars pass daily. Why, the quantity must be estimated by thousands of tons, representing a dead capital of some hundreds of thousands of dollars; and yet, perhaps, none of those roads are capable of supplying all the requirements of half the foreign cars running over them.

Now, who is to blame for this? Are the master car-builders? If we take their own words as answer, it surely cannot be them; for, have they not, one and all, declared and voted in favor of a grand uniformity, beginning with a standard axle, axle-box, brass, and key, and their surroundings? Have they not resolved to adopt a standard system of screw-threads, that an occasional lost nut might be replaced in the twinkling of an eye, and from an ordinary stock, instead of having to rummage through a boxful to find one that at best is only a misfit? Have they not decided on the proper dimensions for a standard draw-bar, having a fixed length, width, and thickness, that do not in any way interfere with anybody's patent rights, and may be made of either cast or wrought iron? Have they not agreed on fixing the brake-mast on the left side of the car as you look at the car end, and on putting the ratchet-wheel and pawl on the roof instead of on a bracket at the end, and about a foot below the roof? Have they not indorsed the wishes of the brakemen and yardmen in promising to keep the ends of their cars, when coupled together, at a distance apart not exceeding two feet, so that the stepping from car to car might be done easily, if not safely? Have they not admitted the fact that the occupation of brakemen was dangerous, and promised to do all in their power to ameliorate their condition? The published record of their doings answers in the affirmative. All these, and a host of other propositions have been so emphatically endorsed by the master car builders, that surely any lack of adoption must be for the reason that they are powerless to act, and that the remedy lies beyond them and in other hands.

Now, if this is the fact, it is desirable to find out with whom the power rests, and where the brakes are being applied, which stop the progress of such common sense improvements. Let us put the question straight. Are the general managers and superintendents the obstructionists? If the writer should answer the question from his own experience, he would unhesitatingly say, No! Certainly not! On the contrary, he would say that those roads that are least interfered with by the superior

powers, are the greatest offenders in producing many of those heterogeneous monstrosities of which there is just cause to complain. Examine, if you please, the cars of any one of our large roads, and compare like parts with like, and it is ten to one that nine out of every ten will be unlike in some of their component parts, and uniformity nowhere, or only conspicuous by its absence.

Sufficient, Mr. Editor, has been said by way of hypothesis to show that there is something wrong as to the manner of car-building, and it is therefore of no use any longer to shirk the question as to who are responsible; for the answer is too palpable, and must be admitted as a fact, that master car-builders themselves are chiefly to blame for all this lack of uniformity, and the sooner they set themselves about the task of rectifying the evil the better it will be for all concerned.

They may not recall the doings of the past, but they can do something in reference to the future if only they will carry out the meritorious resolutions passed by themselves at their conventions. The writer would also suggest that general managers and others assuming control over the building of new cars, should consult with their master car builders as to the details of construction, and insist on having the matter of uniformity duly considered. New line-cars should, as far as possible, be made on one model, and as the truck and draft-gearings of old cars require renewing, they should be reconstructed after the new model. These advantages would entail no serious expense on the owners, but on the contrary, owing to the simplicity of a uniformity of patterns, both new and old work could be effected more readily and with much greater economy, and in due time those expensive and abortive attempts at novelties which are now to be seen in the shape of car attachments, would be consigned to the oblivion they so richly deserve.

JOHN ORTTON,

ST. THOMAS, ONT., February, 1880.

Are End Windows in Cars of any Use?

To the Editor of the National Car-BUILDER:

The suggestion made by me in the January CAR-BUILDER that end windows in cars are unnecessary, has, I perceive, been made the subject of some critical comment in a prominent railway journal, the writer of which favors end windows on account of the "fascinating view" they afford of the scenery along the route. But, so far as my experience goes, this view is most of the time very far from fascinating, because it is either almost wholly obstructed by the next car, or obscured by the smoke, dust and cinders which gather in the wake of the train. Another drawback is, that, to look out of end windows, one must ride backward or sideways, which is far from being agreeable to most people. Let any one notice the rear end of a car, and especially if it is the last car of a train, when it comes in from a trip, and see how the dust, cinders, or snow, gather on the platform and on door and window sills. The assertion made by the writer in the journal referred to, that stoves obstruct the view from end windows only a few months in the year, is hardly in accordance with the facts. I do not know of a trunk line north of the Ohio River where stoves are taken out of cars at all in summer, except it may be a few that are used in excursion or suburban trains. Just imagine the Lake Shore, or the Pennsylvania Company's roads taking out the patent heaters, some of which act as ventilators in summer as well as winter, or the Illinois Central cars dispensing with stoves in April or May because it is too warm to have fires at Cairo, and when the night express reaches Chicago or Dubuque, it is cold enough to have two stoves in full blast in every car. On northern and east and west roads centering at Chicago, there is use for

stoves even in June to my certain knowledge. The writer says that sleeping cars, especially, should have end windows. If so, I would ask why so many new Pullman coaches are built without them, and why these windows in many of the old cars of this company are being paneled up? On most roads first-class cars have two saloons and two stoves. Of what use are end windows in such cars? Water-coolers, for obvious reasons, should not be filled from the car roof or from the inside of the saloon, consequently they should not be placed in the saloon to avoid obstructing the end windows. The creaking often noticed in the ends of old cars is caused, more or less, by end windows, because the necessary braces are wanting to hold the roof frame square with the bottom framing. This every car-builder knows, and the only remedy is to take out the windows and put in long braces running from the corner-post at end sill to door-post at end plate, and a $\frac{1}{2}$ tie-rod through plate and sill down alongside of door post. This will not spread the car, but will keep the frame square, and relieve the end sill of the great strain of the draft-rigging. This matter I will explain more fully at another time, when I propose to say something with special reference to car framing.

It seems to me that the small advantages of end windows are exceeded many fold by the benefits resulting from their disuse, viz: diminished cost of construction and repairing, increased strength, and a greater degree of safety.

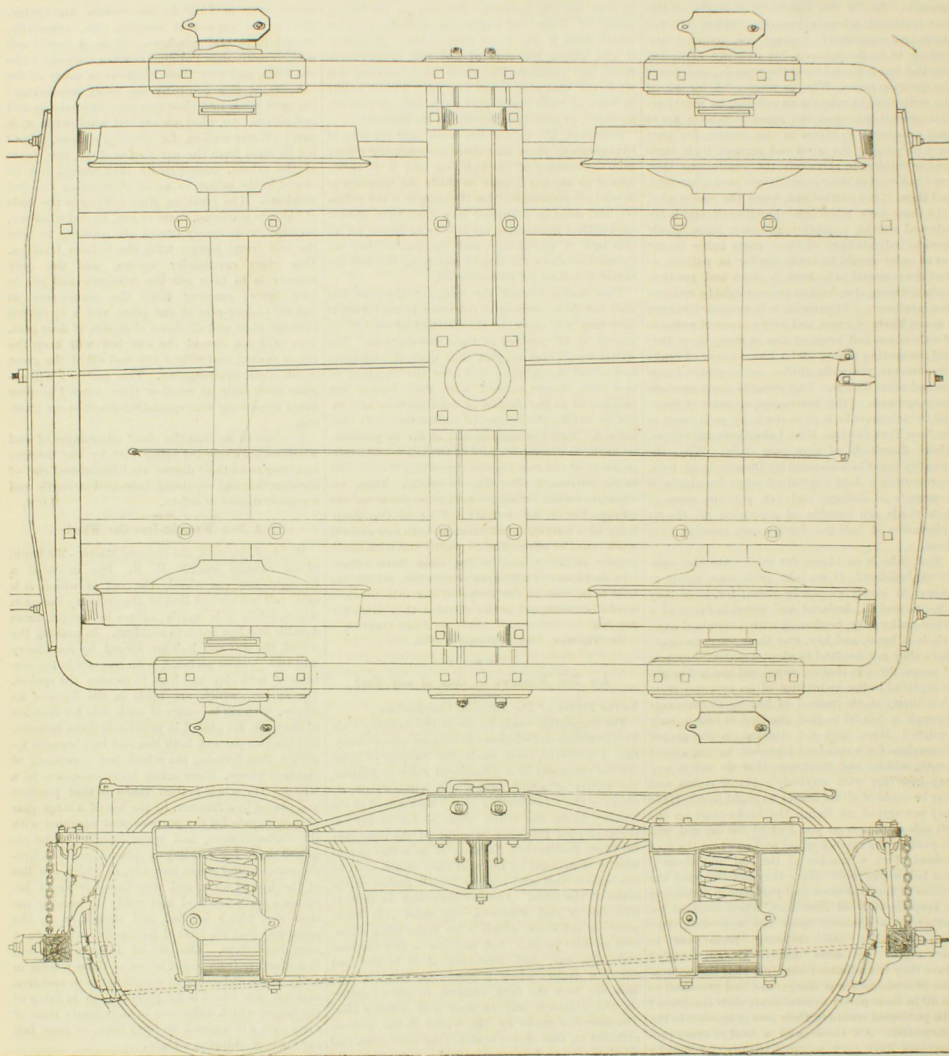
MACK.

A New Wrought-Iron Car Wheel.

Mr. A. J. Stevens, the General Master Mechanic of the Central Pacific R. R., has invented a wrought-iron car wheel, the cost of which, it is said, will not exceed that of the ordinary cast-iron wheel, while it is much lighter in weight, more durable and less liable to accident. In making the wheel, the rim and hub are forged by machinery into two circular sections, with recesses in the sections of both rim and hub to receive the spokes. The spokes, which are made in the form of an ellipse, with rib in centre of each side for increase of strength, are placed in position in these recesses, and the two parts of both rim and hub brought together, thus forming the wheel, but consisting of eighteen pieces, there being fourteen spokes in a wheel. The whole is then taken in that position and placed in a furnace, by the use of a large pair of tongs made for the purpose and operated with the furnace-crane, and when brought to the required heat for welding is placed under a five-thousand-pound steam hammer, in which are dies of the desired form, and with three strokes it becomes a perfect wheel and ready to receive the steel tire, which is fitted and shrunk on in the same way that the tires of locomotive wheels have been heretofore. One set of furnace men will manufacture from eight to ten of these wheels in a day. The difference in weight between cast-iron and this new wheel is 250 pounds each in favor of the latter, which difference in an ordinary train of forty cars will amount to forty tons, or four full car loads of shipping weight.

MR. VANDERBILT has ordered a full restoration of the ten per cent reduction in the pay of the employees of the New York Central & Hudson River road, made some three years ago, the same to take effect March 1.

THE attention of railroad companies is called to the car journal lubricant manufactured by the Eagle Car Box Lubricating Co., of New York. It has been in use for five years, and the company claims that it is considered by the greater part of the railroads in the United States and South America the most effective for saving brasses and cooling journals of any lubricant now in use. See advertisement page 50.



IRON FREIGHT CAR TRUCK—BOSTON & ALBANY RAILROAD.

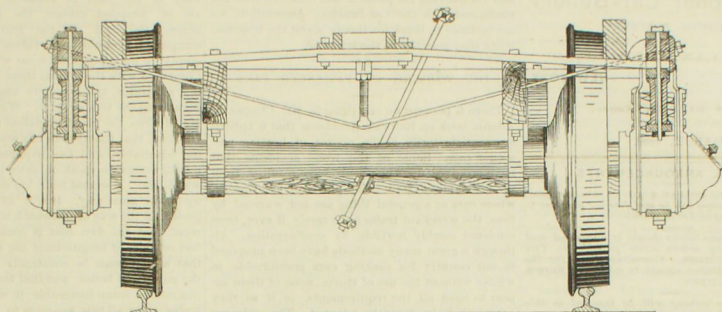
THE engravings on this and the opposite page represent a plan, side view, and transverse section, of the continuous iron frame freight car truck of the Boston & Albany Railroad. The construction is so clearly shown as to require but little explanation.

The frame consisting of but one piece of iron ($8 \times 1\frac{1}{4}$ inch), is not liable to get out of square in running over a line with sharp curves and heavy grades. The arch-bars secure the requisite vertical stiffness in the centre. Outside brakes are used, suspended from truck-frame, and the pedes-

als and oil-boxes can be of patterns similar to those on wooden trucks. The construction is not expensive, while it secures all the advantages of an iron frame, and avoids the disadvantages of wood shrinking away from the iron. The only parts that are of wood are the safety-beams and bolster. The various parts are interchangeable; the bars being bent on formers and the holes drilled from template, secures uniformity and obviates the necessity of knocking the entire truck to pieces in order to repair it. The wheel-base is 3 feet 1 inch.

Buffalo Industrial Items.

A correspondent writes us from Buffalo that general business there is very active, and that the railroads find it difficult to get cars enough to move the freight that awaits transportation, the New York Central having just contracted for 1,300 freight cars, to be built immediately. In the iron trade more men are now employed than ever before, and wages have advanced in some cases from \$1 to \$3 per day. The Union Iron Works, that have been long idle, have started again with 400 men on



their pay-roll, and will manufacture boiler plates, rails and bridge beams, as soon as their furnaces and machinery are in complete running order. The Kellogg Bridge Co. has a force of 120 men and is engaged on contracts for bridges for the Lake Shore, Canada Southern, Iron Mountain, Texas Central and other roads. The Delaney Forge & Iron Works are working to their full capacity, and erecting new and improved machinery on a large scale to meet the largely increased demand for car axles. The Howard Iron Works employ 200 men on full time in the manufacture of their famous Schlenker's Bolt Cutters for railroads. The Gilbert Car Works, recently established in Buffalo, are rapidly getting under way in the efficient charge of Mr. Geo. W. Miller, and are now building 280 box and 150 gondola cars, for the Wabash, St. Louis & Pacific, with some very large contracts about closing which will keep them busy for some time to come. The outlook for a large business on the lakes was never better. The King Iron Works are building two double compound 600 horse-power engines—one for the Union Steamboat Co. and the other for the Western Transportation Co., also several engines of less capacity for other parties. Other works in the same line are equally busy. There is a large demand for vessels for ore transportation from Marquette and Escanaba to Cleveland, Erie and Buffalo, rates having advanced to \$3 from the former place and \$2 from the latter, for the season, and which are equivalent to 6 cts. per bushel for corn from Chicago to Buffalo. There are also many sales of vessels at greatly advanced prices as compared with prices a year or two ago.

Emigrant Sleeping Cars.

Chicago papers say the Union Pacific Railroad is about to make a new departure in the way of a further concession to the comfort of its emigrant passengers. Under this dispensation travel in second-class coaches will be quite a different thing from what it has necessarily been heretofore. The passengers will not be obliged to "camp out" or nap in their seats, but will enjoy in a measure the luxury of a refreshing sleep. The coach is to be of the ordinary size. It is furnished with seats made of light wood and set in iron frames, and with berths which fold up like those in Pullman coaches. Both the seats and the berths are constructed of slats, which insure cleanliness and coolness. The seats fold up when in use during the day, and at night are extended to form the beds. The upper berths are divided by a partition about four inches high, which prevents any selfishly inclined passenger from occupying a whole one. There are six sections on each side, and each section contains two double berths, giving car accommodation for forty-eight persons. The heating and toilet arrangements are simple but sufficient. All the

present emigrant car equipments of the road, comprising about twenty-five coaches, will be converted into the sleeping car pattern as soon as it can be effected. The rates for the use of these cars will not be raised from those charged for the ordinary coaches.

New Publications.

CAR-BUILDERS' DICTIONARY: An Illustrated Vocabulary of Terms which designate American Railroad Cars, their Parts and Attachments; compiled for the Master Car-Builders' Association, by Matthias N. Forney, M. E., assisted by Leander Garvey, Supt. Car Dept. N. Y. C. & H. R. R. R., and Calvin A. Smith, Secretary of the M. C. B. Association. Published by the *Railroad Gazette*, 73 Broadway, New York. Price, 25¢; size, 5½ x 8 inches; 490 pages.

This long looked-for book has at length made its appearance, and we shall be disappointed if it is not appreciated in proportion to its need. It is not necessary to refer to the causes that have delayed its publication, as they are, or ought to be, very well understood by the members of the Car-Builders' Association who first suggested its importance and took the incipient steps in its preparation. The magnitude and difficulty of the undertaking have been realized only as the work progressed, and by those only who performed the labor. Nobody is at fault for the delay, much less are the compilers, who are entitled to the thanks of the Association for the perseverance with which they have prosecuted the task they have so long had in hand.

The book, as its name implies, is a dictionary or vocabulary of names applicable to the various parts of railroad cars in common use, systematically arranged for convenient reference. There is a general index, which is followed by the dictionary proper containing an alphabetical list of about 2,500 names or terms with their definitions, with cross-references after the manner of Knight's Mechanical Dictionary, wherever necessary. This part is printed on tinted paper and comprises about one third of the volume. The residue consists of 300 pages with 800 engravings, showing all the different parts of cars, their attachments, furnishings, trimmings, etc., classified, named and numbered, and forming the most complete collection of this class of illustrations ever published. The whole arrangement is such that when one becomes a little familiar with it by use, the illustration of any part of a car may readily be found, as well as its name, definition, etc. In order to render the volume more compact and practically useful, the compilers have very properly excluded many things, such for example, as the names of the different materials used in car construction, the aim being to furnish appropriate names for the various parts of cars and put an end to the confusion caused by the use of different names for the same parts on different roads, and even on the same roads.

It is a work that has long been needed to enable car-builders to understand one another, not only when communicating by letter or telegram, but when talking together in their conventions. This need is, moreover, constantly growing in consequence of the increasing interchange of cars, and after the long waiting for this unique little volume—the only one in existence, we believe, upon American railroad cars—it remains to be seen whether the car-builders will make it the efficient means of establishing a common language where there is now a babel of confusion. The work, although not absolutely free from defects, is far more perfect and complete, we will venture to say, than many people of a critical turn of mind may, at a cursory glance, be led to suppose. Its merits can only be fully appreciated by study and daily use. It can not of itself do away with the prevailing chaos of terms, but is only the instrument by means of which the end is to be attained. No other or better work of the kind is likely to take its place very soon, and if this one is not turned to some practical account the time and labor expended upon it have been wasted. Every railroad man, and especially every car-builder, should get a copy at once, because the more widely it is distributed the more effectively will it serve the purpose for which it is designed.

THE AMERICAN ENGINEER: An Illustrated Journal devoted to all Branches of the Engineering Profession. Published Monthly. Willard A. Smith, Managing Editor. Smith & Cowles, Publishers, Chicago. Price \$2.00 a year.

The February number of this new publication is very attractive in its appearance, and in the variety and quality of its contents. It is in quarto form, well printed on fine tinted paper, and contains 16 pages of reading matter exclusive of cover. The publishers announce that a number of prominent engineers have been secured as contributing editors, and that the paper will be both original and valuable as a record of engineering progress, not only in this country but throughout the world. Notwithstanding the numerous home publications of this class, there is ample room for more. Our vast railway system, and the activity in mechanical construction, invention and scientific discovery generally, present an inviting field for technical journalism. The publishers have long been identified with the *Railway Review*, and their experience thence derived will enable them to appreciate the wants of the engineering profession, as well as the growing popular demand for the information of which the new journal is to be a medium. Its success can hardly be a matter of any doubt.

It is stated that there are more than 2500 varieties of American apples. And yet the train boy never offers you any except the same old thing; split-leather paring and saw-dust filling, with a bass wood spool for a core.

The National Car-Builder.

PUBLISHED MONTHLY

BY
R. M. VAN ARSDALE,

5 DEY STREET.....NEW YORK.

JAMES GILLET, Editor.

MARCH, 1880.

EDITORIAL ANNOUNCEMENTS.

Subscription.—ONE DOLLAR a year in advance, postage prepaid. One copy will be sent free for one year to any person sending us five new subscribers.

Addresses.—Business letters should be addressed, and drafts and money orders made payable, to THE NATIONAL CAR-BUILDER. Communications for the attention of the Editor should be addressed EDITOR NATIONAL CAR-BUILDER.

Advertisements.—Nothing will be inserted in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. The editorial department will contain our own views and opinions; and the rest of the reading matter, aside from advertisements, will be such as we consider of interest to our readers.

Contributions.—Articles relating to railway rolling stock construction and management, and kindred topics, by those who are practically acquainted with these subjects, are especially desired. Also early notice of changes in railroad officers, organizations and names of companies.

Special Notice.—As the CAR-BUILDER is printed and ready for mailing on the last day of the month, advertisements, correspondence, etc., intended for insertion, must be received not later than the 25th day of the month.

COPIES of the CAR-BUILDER will be kept for sale, and subscriptions received, by A. WILLIAMS & CO., 283 Washington street, Boston, Mass.; and by L. SCHAFFNER, Cigar and News Dealer, Grand Pacific Hotel, Chicago, Ill.

We desire to thank our friends, who have favored us with club lists of subscribers within the past two months. These, with the single subscriptions, which are increasing every day, will add largely to our circulation.

We have made, in this issue of the CAR-BUILDER, a large number of corrections in our Directory of roads and road-officers, from returns received from a very large number of roads, so that it is now as nearly correct as it can be, considering the changes that are constantly being made. We again request that readers will give us prompt notice of such changes, errors, omissions, etc.

We hear that a meeting has recently been held in this city of the representatives of the car departments of a leading trunk line and its Western connections, for the purpose of agreeing upon the construction of a box freight-car, to be accepted and adhered to as a standard by these roads. What progress was made in the matter we are not advised, but will only say that if these roads can't agree about the details of such a car, there is not much use in agitating the subject of a general standard.

It has been decided by the road that in all new trucks of this pattern, iron bolsters will be used instead of wooden ones.

A CORRESPONDENT, whose practical knowledge of the evils of diversity in freight-car construction enables him to speak advisedly, presents his views in another column. What he says is none the less deserving of attention because the subject is a little threadbare. Every railroad man, and especially those in charge of repair-shops on the great East and West lines, knows all about the difficulty complained of. The great question is: Who is responsible for its continuance? Our correspondent gives an answer—from his own point of view, of course;

and considering his position and relations with the roads, and with the Car-Builders' Association, we are inclined to think his theory about the responsibility may possibly be the true one.

THE WARMING OF PASSENGER CARS.

There is perhaps no one thing in Mr. Charles F. Adams' book on Railway Accidents that is treated so unsatisfactorily as the matter of heating passenger cars. Some of the worst accidents that have occurred upon our roads have resulted from the use of stoves for heating purposes. In Europe, where cars as a general thing are not warmed by fires, the wrecks of trains have rarely, if ever, been rendered doubly horrible by conflagration. Although a great many methods have been proposed in our country for making cars comfortable in winter without the use of stoves, none of them appear to meet all the requirements, or if so, they have not been generally adopted. The ordinary wood or coal stoves, although they are so extensively used, are admitted to be unsatisfactory in many respects, and numerous attempts have been made to improve their construction so as to render them less dangerous in cases of collision and the overturning of cars.

The experience of the New York elevated roads in the use of steam for warming cars is suggestive of some important points which deserve the attention of inventors who are at work upon the problem. Stated briefly, the general system consists in forcing steam from the engine through pipes running lengthwise through the trains, the pipes being jacketed with galvanized iron, and the intervening space filled with sand for the purpose of storing up the heat. In moderate weather, the cars are by this means very comfortably warmed, but in very cold weather there is not only a lack of the requisite warmth, but a very considerable waste of steam. In order to prevent the supply of steam from being cut off entirely by the accumulation of water in the pipes from condensation, it is necessary to let the steam blow off at the end of the train, and at each of the couplings even. The use of sand for storing heat does not seem to obviate the necessity of constantly blowing steam into the pipes.

This evidence, however, is hardly necessary to explode the theory of heating cars with steam from the locomotive. It is impracticable for reasons that have been set forth again and again. It is quite manifest that if stoves are ever to be superseded by any other method, it must be by the use of hot water, supplied either from the locomotive boiler, or from a heating apparatus in each car, or else from a general heater in the baggage car for the whole train. Taking either water or steam from the boiler is practically out of the question. A fire for the purpose in each car would be equivalent to a stove as a source of danger in case of accident. So that, in order to make hot water available for all trains, it must be heated independently of the locomotive, and circulated through the pipes by means of a power distinct from the engine. The practicability of this plan has, in fact, been very well tested within the past year by the Pennsylvania Railroad Company. Something more than a year ago a train was fitted up with an apparatus for warming the cars with hot water, the details of which were given in the CAR-BUILDER for April, 1879. It consists of a horizontal boiler which occupies, with its fixtures, about 12 feet lengthwise of the baggage-car. To this boiler is attached a Worthington pump, and a double set of pipes which make the circuit of the train with a loop under each seat. Through these pipes the hot water is forced continually, returning to the boiler without any material waste in volume, or even in temperature, if the pump is run at a high speed, as it can be in severe weather, when more

heat in the cars is required. The couplings are of wrapped rubber, the pipes are joined across the end of the rear car so as to complete the circuit, and valves are provided for emptying the pipes of each car when not running. Combined with the system there is also a ventilating apparatus, and registers under the seats for regulating the temperature. We are informed by Mr. McCrea, the Superintendent of the New York Division, that this system has worked and is working admirably, and has required no changes or modifications, to speak of, since the first trial of it was made. A second train has recently been fitted up in the same way. It will of course be suggested, in the way of drawback to such an arrangement, that the first cost is considerable; that 12 feet or more of longitudinal car space is required; that a man must be constantly employed to run the pump and boiler; and that the cars so equipped can not be interchangeable in winter with other trains. But all this amounts to but little as compared with getting rid of stoves and the attention they require, to say nothing of the far greater safety in case of accident and diminished risk to property and life from conflagration.

FREIGHT-TRAIN BRAKES.

A correspondent writes us in reference to the doubts that are entertained by many railroad men as to whether it is possible to construct a freight-train brake that will meet all the requirements of such an appliance as set forth in the reports of the committee of the Car-Builders' Association. He claims to have perfected a brake that will "fill the bill," and says that it is ready for exhibition. "It is automatic in the true sense of the word, the power is derived from the momentum of the train and is as great or greater than that of any air or vacuum brake, it has no coupling but the ordinary link and pin, can be applied to each car in the train independently of the others, and the retarding pressure increased in proportion to the weight of load upon each car respectively."

In accordance with his request, we print the above for the benefit of those who are on the lookout for such an invention. We would suggest to him, however, that similar claims have already been made by other inventors, and that they amount to very little apart from the actual performance of the brake upon moving trains. When put to the test it may not fully justify his claims. This is the important point to be determined, and we would recommend him to communicate with Mr. C. E. Garvey, of Morrisania, N. Y., who is chairman of the committee on freight-train brakes. This committee is on the lookout for just such a device as our correspondent claims to have invented.

RAILROAD LEGISLATION IN CONGRESS.

Federal supervision of railroads, so far as interstate commerce is concerned, has assumed a slightly new or modified phase. A substitute for Mr. Reagan's bill has been adopted by the House Committee on Commerce, and will be considered by the House, in all probability, at no very distant day. The new bill provides for the appointment of three commissioners to exercise supervision over all railroads that are not exclusively within the limits of one state or territory, with powers only to investigate and report in respect to the operations of such roads as affecting interstate commerce. A railroad year is to be prescribed, and a system of reports covering such year. Information is to be furnished to the several departments of the government respecting fares and freight charges, and railroad accounts. Unreasonable rates on interstate traffic are forbidden, also discriminations between shippers for like and contemporaneous service on the same line of road. Rebates in every form are pro-

hibited, and any arrangement to prevent continuous carriage without break of bulk. The provisions of the act are not to apply, however, to any shipments of less than a car-load, nor to any within the limits of a single state.

The arguments and representations of the leading experts in the science of railway transportation, Mr. Fink, Mr. Blanchard and others, seem to have had their effect on the committee by inspiring its members with some degree of self-distrust as to their ability to frame a law, during the brief moments of respite from partisan electioneering, to regulate railroad business in all its multitudinous details and complications. The more these legislative Solons really find out about it, the more will they realize their own incapacity. In the provisions of Mr. Henderson's substitute nothing is said about prohibiting a higher charge for a shorter than for a longer distance, nothing about posting schedules of rates; and the pooling business is only made a subject of inquiry. This indicates an advance in the right direction. A right understanding of the condition and working of railroads should precede the enactment of laws for the regulation of traffic. They are already subject to the code pertaining to common carriers, and any further legislation that may be needed to regulate railway interstate commerce should be based on the kind of information that a national commission composed of capable men with the requisite authority, can collect. It is not at all likely that this bill will speedily become a law. It must first pass both Houses and be approved by the President, and in such event it is not likely to work any very great amount of mischief. The commission can do little more than investigate, call attention to existing evils, and advise the remedies that should be applied.

SUSPENSION CAR TRUCK—A CORRECTION.

In the second paragraph of the illustrated article in our last issue descriptive of "A Suspension Car Truck," an error occurred which conveyed a wrong idea in regard to the leading object or purpose of the construction, and made it to some extent unintelligible. The following is the paragraph entire as it should have been printed:

"First, to receive all lateral motion or shock from any inequalities of the track singly on each pair of wheels with their axles and boxes, without transmitting such motion or shock to the truck frame; or, in other words, instead of multiplying the distance of this lateral movement of the wheels and axles by interposing lateral springs or swing-links between the truck and car body (heretofore so necessary to diminish or ease the shock), this shock is taken up and exhausted at the contact of rail and wheel, thus doing away with the necessity of a swing-bolster."

We would also state that the truck, as shown, is designed for freight service exclusively.

RAILROAD OPERATING EXPENSES.

The extraordinary advance in the prices of iron and steel manufacture within the past year begins to tell heavily in the matter of railroad operating expenses. The ratio of these expenses to earnings has hitherto been forced by the most rigid economy to correspond with the excessively low traffic rates that have ruled for a long time. But it is evident that these relative expenses can no longer be maintained upon the basis of the same amount of traffic and the same general average of rates. There must either be a largely increased traffic or an increase of rates, or else a falling off in net earnings. No amount of skill on the part of managers can avoid this result, and the public may as well begin to realize the fact that cheap freights will be gauged in future according to a different scale. A few months have changed the relations between railroad expenses and earnings amazingly. The estimates for rolling stock, rails and material, at prices current a short time ago,

are no criterion for contracts now. Not only have iron and steel materials in their various forms very greatly advanced, but such is the pressure to get orders filled, that managers cheerfully wait their turn to pay more than double the prices they declined to pay a year ago. And then, behind all this is the problem of wages which begins to loom up. The pay of employees must be increased with the increased cost of the necessities of life. The movement is already in progress, and although not so decided in its character as some of the other "booms," it is bound to keep on until wages are scaled up so as to be in line with the general relations of value. The only favorable circumstance in view of the impending reconstruction of rates upon the basis of higher figures, is the enormous volume of freight traffic, and the probability that it will keep on increasing in the same or perhaps a still greater ratio than it has during the past six or seven years of depression. This traffic is a sure thing, and if railroad interests suffer from increased operating expenses, it will only be due to a ruinous tariff of rates induced by competition or regulated by state interference.

A WORD ABOUT CAR VENTILATION.

If the half that is said by learned professors, inventors and others, about the horrors of badly ventilated cars is true, the risk of injury and sudden death from the general run of railroad accidents is a small matter compared with the risk incurred by breathing the deadly elements in the atmosphere of an overcrowded car. As almost the entire population travel in cars more or less, there is of course a considerable number of fussy, nervous and fanatical people who are frightened at these representations, and really believe that with every breath they draw while they are on a train in the winter season, they are inhaling noxious gases and animal effluvia that undermine their health, fill their veins with blue blood and plant the germs of inextinguishable disease in their systems. These people are, it is true, not very numerous as compared with the great mass who are indifferent about what kind of air they breathe so long as they feel comfortable; but they think, and talk and worry about it, write bitter complaints to the newspapers, and wonder why patent ventilators are not used that will keep the air in the cars pure and sweet all the time and under all circumstances, no matter whether the train passes through malarial swamps, or along the lee side of a dozen bone-boiling and hog-slaughtering establishments. This kind of talk became so clamorous a few years ago that the car-builders became a little worked up on the subject, and thought something must be done. In order to deal with the problem intelligently, the libraries were ransacked for technical authorities about atmospheric conditions, the nature of gases, chemical affinities, germs of disease, morbid exhalations, the number of cubic feet of fresh air a person needs per minute, and so forth. Circulars were sent out asking for information, cars were filled with chemical fumes to show the direction of the currents, elaborate reports were made by committees, and the discussions were kept up at the annual and monthly meetings of the Association, until interest in the subject gradually died out from utter weariness and exhaustion. Indeed, it is now no easy matter to get any of the old members to "unlimber" on the subject of ventilation. They prefer to listen, if they listen at all, to outsiders. It has been discovered that to ventilate cars so as to satisfy the whims and susceptibilities of every individual passenger is an impossibility. This is now pretty well understood by car-builders, and they are quite likely to rest content with the usual side, top and end ventilators, as the simplest, cheapest and most effective way of preventing the accumulation of bad air in cars. And this is really

all the great majority of travelers need or care for, and all the companies as a rule are disposed to furnish. An attempt to please every body can never be entirely successful.

Many incidents have been related to show how much imagination has to do in exciting the fears of nervous people about breathing impure air, but the following is perhaps as good as any. It was told at the recent car-builders' monthly meeting, by Mr. Adams, of the Boston & Albany. It has also been told at some of the annual meetings, but will bear repetition: "A man with a mania for fresh air was lodging in a room to which he was not accustomed, and awaking in the night with a feeling of oppression, he imagined it was owing to a lack of ventilation. He got up to raise the window, and as the room was very dark, he groped around till he got his hands on a sash with glass in it, which he tried to raise, but with all his efforts it remained immovable. In his desperation, he broke out one of the panes, determined to have some fresh air at any cost. He got into bed again feeling very much relieved by the improved ventilation, slept soundly until morning, when he awoke, and, upon looking around discovered that instead of breaking the window, he had merely broken a pane of glass in a book-case on the opposite side of the room!"

RAILROAD CONSOLIDATIONS.

Consolidations, leaseings and close alliances, are just now the conspicuous features of railroad progress in this country. Aside from the schemes that have already been consummated, there are rumors from all quarters of negotiations looking to a union of railroad interests under one management that have hitherto been separate and even hostile. Taking a broad view of the vast system, its wonderful development, the territory traversed, the growth of traffic, and the numerous competing points both inland and coastwise, for the distribution and shipment of products, the tendency to consolidate into geographical currents and arteries is natural and unavoidable. It is a movement which, it may be said, has just begun, and will become more general as time advances. All the conditions of railway prosperity demand it, nor is it likely to work any injury to owners, shippers, employees, the traveling public, or the country at large. The fears that such a movement, if allowed to take its natural course, will subject the great business interests of the country to the absolute control of a few individuals who figure as railway "magnates," will turn out to be unfounded. The recent virtual consolidation of the lines from St. Louis to the South Atlantic and Gulf ports is very significant, not only in itself, but as the forerunner of other combinations looking to a great prospective increase in the trade of southern ports, by a diversion of western traffic from the leading trunk lines of the north. However powerful these great consolidated interests may turn out to be as the mere controllers of capital, they can never permanently subvert the laws of trade or override a unanimous public sentiment. Being the creatures of law they can never become its creators, except indirectly, nor even then so long as we have a government worth preserving.

From the present outlook, there are likely to be great changes within the next ten years in the arterial systems of our roads. The multitude of little veins which now make up the dense and intricate network, will coalesce more and more, and run together in obedience to a law of mutual attraction and interest, and the more these disjointed details are brought under general systems of management, the less there will be of wasteful expenditure caused by frequent changes of officers, incompetent subordinates, and the endless diversity in mechanical appliances which is the subject of so much complaint. Many a dilapidated, pov-

erty-stricken road, unable of itself to earn its expenses, will by absorption be lifted out of the slough and made productive.

"BLACK LISTS" are perhaps well enough in certain emergencies, and where an evil is of such an aggravated nature that it can not, in the absence of legal restraint, be rooted out in any other way. As a rule, however, such lists are not popular, and when resorted to should be very judiciously used in order to avoid doing injustice to parties who have no opportunity afforded them to be heard in their own defense. According to current report, the Central Association of General Ticket and Passenger Agents is doing a very effective work, by the use of this means, in preventing the issue of free passes upon false representations, as well as the improper use of such as are obtained legitimately. But if we are not misinformed, injustice has been done in one case at least by undue publicity, when an explanation of the circumstances would have prevented it.

Car-Builders' Monthly Meeting.

The monthly meeting for February was held at the Association Rooms on the 19th ult., the topics for discussion being the old and familiar ones of car ventilation, lighting and heating. The attendance was very good, and among those present were several representatives of the car departments of prominent roads. The difficulties in the way of ventilating passenger-cars in a satisfactory manner were dwelt upon, and also the much-belabored problem as to the precise quantity of fresh air required by each person per minute. It was contended by one of the speakers that ten cubic feet was little enough, and that consequently this amount for each occupant must be taken in, and a like quantity taken out of a car every minute, and in such a way as not to annoy any one. How to do this, however, was the thing to be determined. Another speaker could not understand how ten cubic feet of air could be got into a person's lungs and out of them in a minute. He thought two cubic feet a minute would be good and sufficient ventilation, and that the ventilation of a car should be independent of the heating. The nature of carbonic acid gas was also discussed incidentally—whether it had an odor, how much of it was required to destroy life, whether it went down to the floor or up toward the roof, or whether it became diffused and its noxious properties in that way destroyed.

The matter of refrigerator-car ventilation was next taken up, and the testimony of those present, who had given special attention to the subject, was to the effect that moisture was the most prolific cause of decay, both as respects meats and vegetables, because it generated the impure gases. In the case of vegetables, moisture caused fermentation, and must be got rid of. A low temperature was not so essential as dry air. Less ice was required for fruits than for meats; but in reference to the latter, only about one-tenth of the space in an ordinary refrigerator car could be spared for ice, which was not a sufficient quantity to create a current of air, hence artificial means had to be employed. The outside air should not come in contact with the ice, but the air in the car should be kept in motion by a fan, so as to bring it in contact with the ice, which was a powerful disinfectant, and destroyed the impure gases.

In reference to the lighting of passenger cars, an inquiry was made whether all 200 fire-test oils were equally safe. It was replied, that so far as the test was concerned, they were all equally safe, no matter who manufactured them; but their illuminating qualities differed very much, according to the processes of manufacture. There were at present five different makers of oils of this test

in this country. The products of three of them were about the same as to the light produced. It was not necessary that oils of different gravities should be combined in the same proportions and by the same processes, in order to stand the same fire-test.

THE FATAL CAR

I.
They cast it, therefore, in the ditch,
And left it there to rot away,
'Bout ten miles from the nearest switch,
A thing of horror in its day;
A genuine devil-trap it was,
Which did not work by earthly laws.

II.
But where the trickery lay concealed,
Or how the hell-contrived plan,
So far has never been revealed.
And may not ever be to man;
Whoever took a certain seat,
A sudden death was sure to meet.

III.
The last place to the right but one,
Just as the train went East or West;
And there that night (the car's first run),
A brakeman took a moment's rest:
On brakes!! On brakes!! the signal said:
His lamp went out, and he was dead.

IV.
The Car Inspector sat there next
To feel how ran the springs;
"They don't go easy," said he, vexed,
"They make such rigid things."
Just then Conductor Smith passed by—
But not in time to see him die.

V.
The priest who came with pious care,
To gently close the dead man's eyes,
And murmur o'er his form a prayer
That he might live beyond the skies:
Before his prayer was said almost,
The Holy man gave up the ghost.

VI.
And as it happened day by day,
Fresh comers took that ghastly place;
And those who came were doomed to stay,
In Death's infernal embrace:
Such numbers of the people died,
There were not many left to ride.

VII.
Then persons who had given thought
To note the thing, which some had not,
Declared that all the evil wrought
Had happened in that only spot,
And even those who scoffed thereat
Would sit in any seat but that.

VIII.
The President sat there at last,
To lift the superstitious load,
Which heavier grew and threatened fast
To crush the fortunes of his road:
"More Apoplexy, please!" he said,
And in a moment he was dead!

IX.
Still others tried it, and they shared
The common fate, excepting one,
And he who sat there and was spared,
Was looked with awe and fear upon.
He helped to build the car—Black Dan!
A Fiend he seemed like—not a man.

X.
They cast it, therefore, in the ditch,
And left it there to rot away,
'Bout ten miles from the nearest switch,
A thing of horror in its day;
A genuine devil-trap it was,
Which did not work by earthly laws.

JOSEPH TAYLOR.

DON'T take any of the quack rostrums, as they are regal to the human cistern; but put your trust in Hop Bitters, which will cure general ability, costive habits and all comic diseases.

THE locomotive electric light, recently introduced in England for railway use is said to operate satisfactorily. It consists of a light six horse-power four-wheel locomotive, with a dynamo-electric machine attached, and any electric light may be used. When the engine is moving along the line, the electric machine rotates at its proper speed, and when it is necessary to stop in order that the light may be directed on some particular spot, the driving wheels are thrown out of gear by means of the disengaging handle attached to the pinion on the crank shaft, and the machine ceases to move the dynamo-machine at its proper velocity. The engine is furnished with sensitive governors, so that the speed of the dynamo-machine may be accurately regulated, this being very important in order to insure a bright and continuous light.

MR. CHARLES LINSEY, the inventor of the Flexible Wheel Base Car, illustrated in this issue, desires a position on a railroad. He has had large experience on South American roads, and is an ingenious and capable mechanic. He may be addressed at the office of the CAR-BUILDER.

Our Directory.

We note the following changes since our last issue. Readers are requested to give us prompt notice of changes when they occur.

Alabama Great Southern.—Mr. John Scott has been appointed Assistant General Manager, and R. W. Healey, Purchasing Agent.

Bedford, Springfield, Owensboro & Bloomfield.—Mr. J. W. Kennedy has been appointed Superintendent, in place of E. Hulbert, who has gone to Texas. Mr. Kennedy was recently Road-Master of the Jeffersonville, Madison & Indianapolis.

Buffalo, Chautauque Lake & Pittsburg.—This road has been consolidated with the Pittsburg, Titusville & Buffalo.

Burlington & Lamoille.—We are informed that the appointment of N. H. Leach as Superintendent, vice D. C. Lindsey, as announced in our last issue, is erroneous. Mr. Lindsey is the General Manager, which position he has held for a considerable time.

Cumberland & Pennsylvania.—The position of Master Mechanic, heretofore filled by Mr. J. F. Van Horne, has been abolished.

Fort Wayne & Jackson.—Mr. M. D. Woodford has been appointed General Superintendent of this road—formerly Fort Wayne, Jackson & Saginaw.

Houston, East & West Texas.—Mr. E. Hulbert, late of the Bedford, Springfield, Owensboro & Bloomfield road, has been appointed General Superintendent.

Illinois Midland.—Mr. H. H. Osborn has been appointed master mechanic, vice J. G. Clifford. Mr. Osborn was for some years master mechanic of the Paducah & Memphis.

Jacksonville, Pensacola & Mobile.—Mr. Jas. D. Hollister has been appointed Master Mechanic and Master Car Builder, vice John F. Laird, resigned.

Missouri Pacific.—Mr. A. W. Dickinson, heretofore Ass't Superintendent of Union Railway & Transit Co., has been appointed Ass't General Superintendent of this road.

New York, Ontario & Western.—This is the name of the New York & Oswego Midland under its new organization. Mr. Theodore Houston has been chosen General Manager. Mr. A. H. Danforth is Acting Superintendent of the Southern Division, vice T. C. Purdy, resigned.

Richmond & Petersburg.—Mr. Theo. D. Kline has been appointed Superintendent, vice A. Shaw. Mr. Kline was previously Superintendent of the Charlotte, Columbia & Augusta.

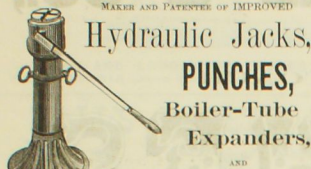
St. Louis & Southeastern.—This road is now known as the St. Louis Division of the Nashville, Chattanooga & St. Louis. E. Culverhouse is Division Superintendent.

Texas & Pacific.—Mr. J. S. Noble, Superintendent of the Transcontinental Division, has been placed in charge of the Jefferson Division also, in place of E. Marsh. Mr. C. Harris has been appointed Superintendent of the Southern Division.

Toledo & Ann Arbor and Detroit, Hillsdale & Southwestern.—Mr. J. W. Smith, of Detroit, has been appointed General Manager of these roads. He has heretofore been General Manager of the Erie & North Shore Line.

Toledo, Peoria & Western.—This company is the successor of the Toledo, Peoria & Warsaw.

RICHARD DUDGEON,
No. 24 Columbia St., New York,
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**Hydraulic Jacks,
PUNCHES,
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Expanders,**

DIRECT ACTING

STEAM HAMMERS.
JACKS FOR PRESSING ON CAR-WHEELS OR CRANK
PINS MADE TO ORDER.

Communications by letter will receive prompt attention.

**FRENCH'S
CELEBRATED PLUMBAGO OILS.**

The only Oils which will hold Plumbago in
absolute suspension in any climate
and for any length of time.

Hot Journals made impossible by their use,
and wear of brasses reduced to mini-
mum. Cutting of Valve-Seats and
Cylinders avoided.

The Cheapest and Only Perfect Lubricants
known for Railroad Car Journals, Heavy
Bearings, Fast-Running Machinery,
Cylinders, etc.

These Oils have been thoroughly tested in comparison with
a number of the best known lubricants, by **Prof. R. H.
Thurston**, in charge of the Department of Engineering,
Stevens Institute of Technology, Hoboken, N. J. Prof.
Thurston reports that, gallon for gallon, **French's Plum-
bago Oil**, for railroad services,
Is worth 4.82 times as much as Sperm Oil.

" 12.33 " " **Lard Oil.**
" 9.25 " " **W. Va. Oil.**
" 15.51 " " **Ordinary Reduced
Black Oil.**

With the further advantage to our Plumbago Oils of little
tendency to gum, and **entire freedom from Acid.**

EXTRACT FROM REPORT OF PROF. THURSTON.

THE "FRENCH'S PLUMBAGO OILS" thus appear to possess
those much-sought-for qualifications which are practically
necessary to the complete realization of the great advantages
in lubricating and cooling, possessed by Plumbago as a lubri-
cant.

Very respectfully, R. H. THURSTON.

The following are a few out of hundreds of practical tests
with our oils:

H. WATKEYS, SIFT, MOTIVE POWER & Y. C. &
H. R. E. Western Division, RAN THE FEEDER OF
ENGINE 180 (FAST PASSENGER) THREE AND A
HALF MONTHS 120 miles per day, or ABOUT 12,000
MILES, WITH ONE OILING WITH OUR PLUMBAGO
COACH OIL, and states that it would have run longer,
but engine was stopped to put under new wheels.

PASSENGER CAR 130 ON THE N. Y. C. & H. R. E.
RAN 20,000 MILES WITH ONLY ONE OILING WITH
OUR PLUMBAGO COACH OIL, AND NO OTHER OIL
USED.

WAGON SLEEPING-CAR NO. 40 ON SAME ROAD,
RAN 15,000 MILES WITH ONLY ONE OILING OF
SAME, AND NO OTHER OIL USED.

WAGON DRAWING-ROOM CAR "CITY OF ROME"
AND "CATSKILL" RAN ON N. Y. C. & H. R. E. EACH
10,000 MILES WITH ONE OILING.

N. F. CHAPMAN, MASTER MACHINIST, CLEVELAND,
PITS. R. E. CERTIFIES THAT HE RAN COACH NO. 37
ON THAT ROAD 33,470 MILES WITH ONE OILING OF
OUR COACH OIL.

W. F. TURKLEY, MASTER MECHANIC, CLEVELAND,
TUSCARAWAS VALLEY & W. RAILING R. E. CERTI-
FIES THAT COACH NO. 8 RAN ON THAT ROAD 24,400
MILES WITH ONE OILING OF OUR PLUMBAGO COACH
OIL.

Henry Jones, Engineer, certifies that our Plumbago Cylin-
der Oil lasts twice as long for Cylinder use as Sperm oil, and
that with **HALF THE PRESSURE OF STEAM HE GETS
THE SAME POWER AS WHEN LUBRICATING WITH
SPERM OIL.** He states that his cylinder and valve-seats
are in better condition than when new, three years ago, and
cylinder "polished like a mirror."

ONE OILING PLACES ON ANY LINE OF RAILROAD, NO
MATTER HOW LONG, IS ALL THAT IS NECESSARY
WHERE OUR OILS ARE USED, A GREAT SAVING
EFFECTED BY REDUCING FORCE OF "DOPERS."

WE OFFER ALSO A LINE OF SUPERIOR BLACK OILS,
AT LOW RATES. ALSO A SUPERIOR ASSORTMENT OF
WHITE OILS.

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Particular attention is called to the "AUTOMATIC" and "LOCOMOTIVE DRIVER BRAKES," now being tested and
adopted by the prominent lines.
With the "DRIVER BRAKE" the engineer can handle an ordinary freight train better than with brakemen. The sav-
ing in car wheels and wages will therefore be apparent. On shifting or yard engines it is invaluable.
The "AUTOMATIC" has proved itself to be the most efficient train and safety brake known. Its application is instan-
taneous; it can be operated from any car in the train, if desired, and should the train separate, or a hose or pipe fail, it
applies automatically. A GUARANTEE is given customers against loss from PATENT SUITS on the apparatus sold them.
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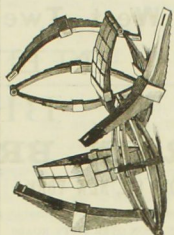
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Of the Best Grades of Cast Spring Steel;

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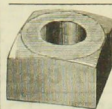


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The following Tools were bought new in 1873, to fit up the Petersburg Car Works (Virginia), and not having been used a single
day, they are now in complete order, and have every accompaniment which comes with them, new from the factory. They will be
sold, boxed, and delivered, F. O. B. cars, at the following low rates, which it is impossible to beat:

ONE No. 4 Woodburn Planing and Matching Machine, { Factory Price, \$3000.....	Price, \$1000
Planes 4 sides, 24 inches wide. Tongues and Grooves,	
ONE extra heavy Gray & Wood's Planer. Planes 33 feet long and 24 inches wide. Factory price, \$1300.....	600
ONE Richards, London & Kelly's Cross-Grinding and { Factory Price, \$1000.....	500
Re-hating Machine. 10-foot Table, and Counter-Shafts,	
ONE No. 2 40-inch Richards, London & Kelly's Band Saw. { Factory Price, \$350.....	200
With Patent Gauge and Pettis Saw Blade, 4 1/2 x 20 1/2 feet,	
ONE Gear's Variety Upright Moulding Machine. Factory price, \$430.....	200
ONE J. A. Fay & Co.'s Vertical Car Tenoning Machine and 2 Extra Heads, with Cutters. Factory price, \$850.....	450
ONE S. A. Wood's Saw Gunning and Sharpening Machine. Factory price, \$65.....	30
ONE J. A. Fay & Co.'s Moulding Double-Hoist Tenoning Machine, no Gages. Factory price, \$250.....	150
ONE C. B. Rogers & Co.'s Iron Frame Railway Saw Machine. Factory Price, \$135.....	70
ONE Automatic Knife Grinding Machine, with Emery Wheel, 22 x 1 1/2 inches. Factory price, \$135.....	70
ONE Second-hand Car-Wheel Boring Machine.....	300
ONE Second-hand Wheel Press.....	200

Address **A. A. ALLEN & CO., Petersburg, Va.**

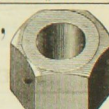


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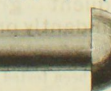
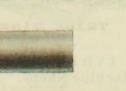
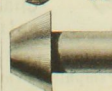
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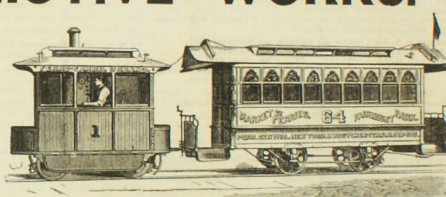
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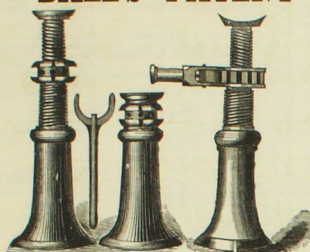
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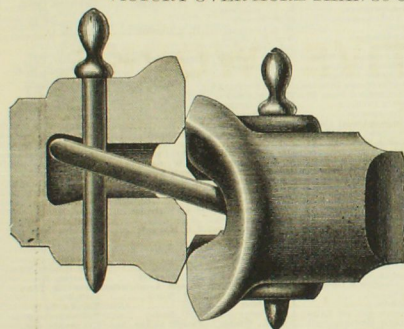
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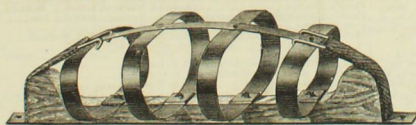
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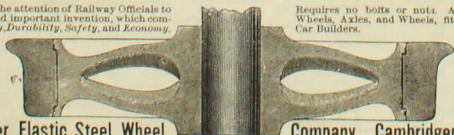


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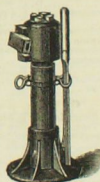
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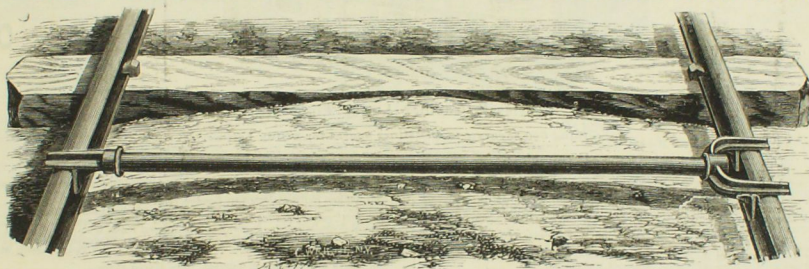
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Baltimore & Annapolis	Geo. A. Sanders	Allen Wood	Baltimore, Md.
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Utah Northern	Geo. W. Thatcher	W. W. Rifer	Salt Lake City	Wilmington & Northern	J. H. Thompson	J. F. Divine	Catesville, Pa.
Utah Western	J. F. Maynard	W. W. Rifer	Salt Lake City	Wilmington & Weldon	J. F. Divine	J. F. Divine	Wilmington, N. C.
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THE HUNTINGTON TRACK-GAUGE



is made with $\frac{1}{2}$ -in. iron pipes screwed with a tapered thread into malleable-iron heads, and is modeled so as to secure in a high degree the advantage of

STRENGTH, LIGHTNESS AND ACCURACY.

The forked end, which has two lugs which bear against the rail, secures a perfect gauge, even in the hands of a careless section-man, as it requires no judgment or correct eye to place the gauge exactly perpendicular to the rail, and it is also an important feature of this implement that even if it be swung as much as six inches out of perpendicular, it will not cause a variation in the gauge of more than one-thirty-second of an inch, whereas it is easy (and not uncommon) in using an ordinary gauge, to place it so carelessly as to cause a variation of from one-half inch to one inch.

At and near frogs and switches, and where a guard-rail lies within the track, this gauge is particularly convenient and useful, as the lugs at each end project down so far that the implement stands clear of any intervening obstacles. At such points and on curves, where an accurate gauge of the rails is most difficult to be secured, and at the same time most desirable for economy in operating the road, this gauge saves the time of section-men, and in one respect, at least, secures good work from them.

It is inexpensive, and not breakable with ordinary usage.

Wherever it has been used, the road-masters and section foremen indorse it heartily. The following are some of the companies which have adopted it, and, as the excellence of the permanent way of these roads is well known, their practical indorsement is worthy of note:

ATLANTIC & GREAT WESTERN RAILROAD—PENNSYLVANIA RAILROAD—ALLEGHANY VALLEY RAILROAD—CLEVELAND, COLUMBUS, CINCINNATI & INDIANAPOLIS RAILROAD—PITTSBURGH, CINCINNATI & ST. LOUIS RAILWAY—ATCHISON, TOPEKA & SANTA FE RAILROAD.

The Huntington Track-Gauge patent is owned by R. M. Van Arsdale, John N. Reynolds and the undersigned, and from either of them gauges and any further information may be obtained.

W. H. BOARDMAN, 73 Broadway, New York.

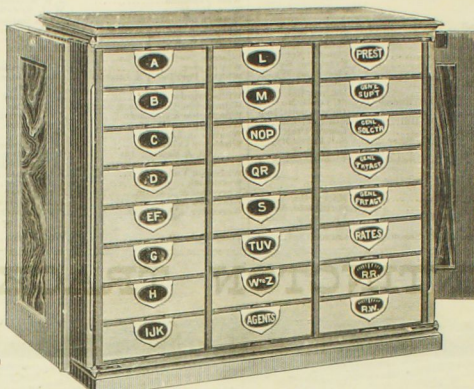
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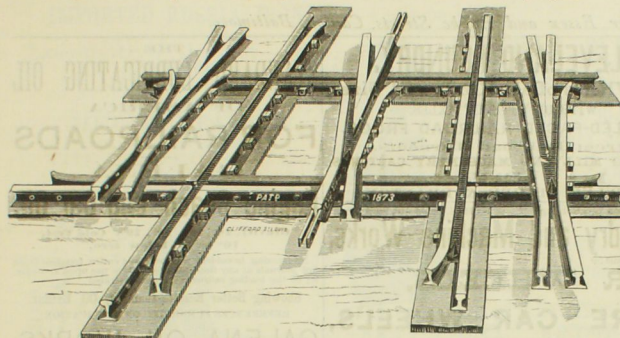
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Send for samples before buying any other.

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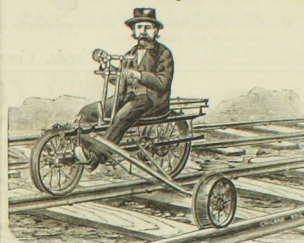
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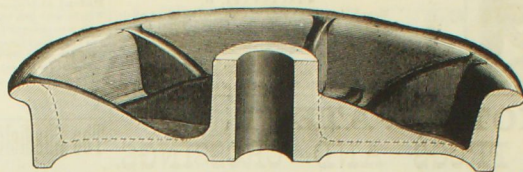
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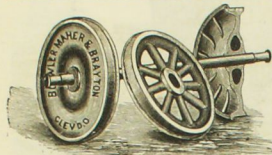
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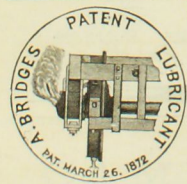
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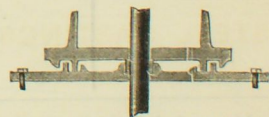
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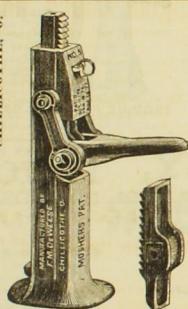
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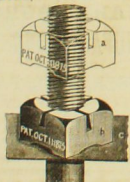


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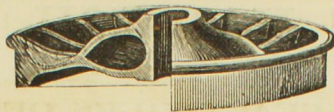
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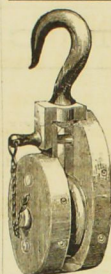
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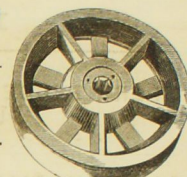
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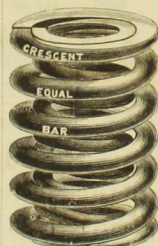
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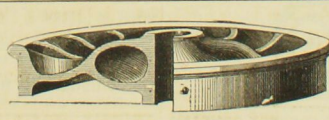
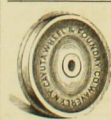
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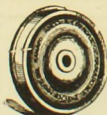
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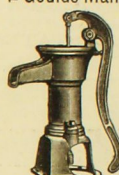
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